AIN
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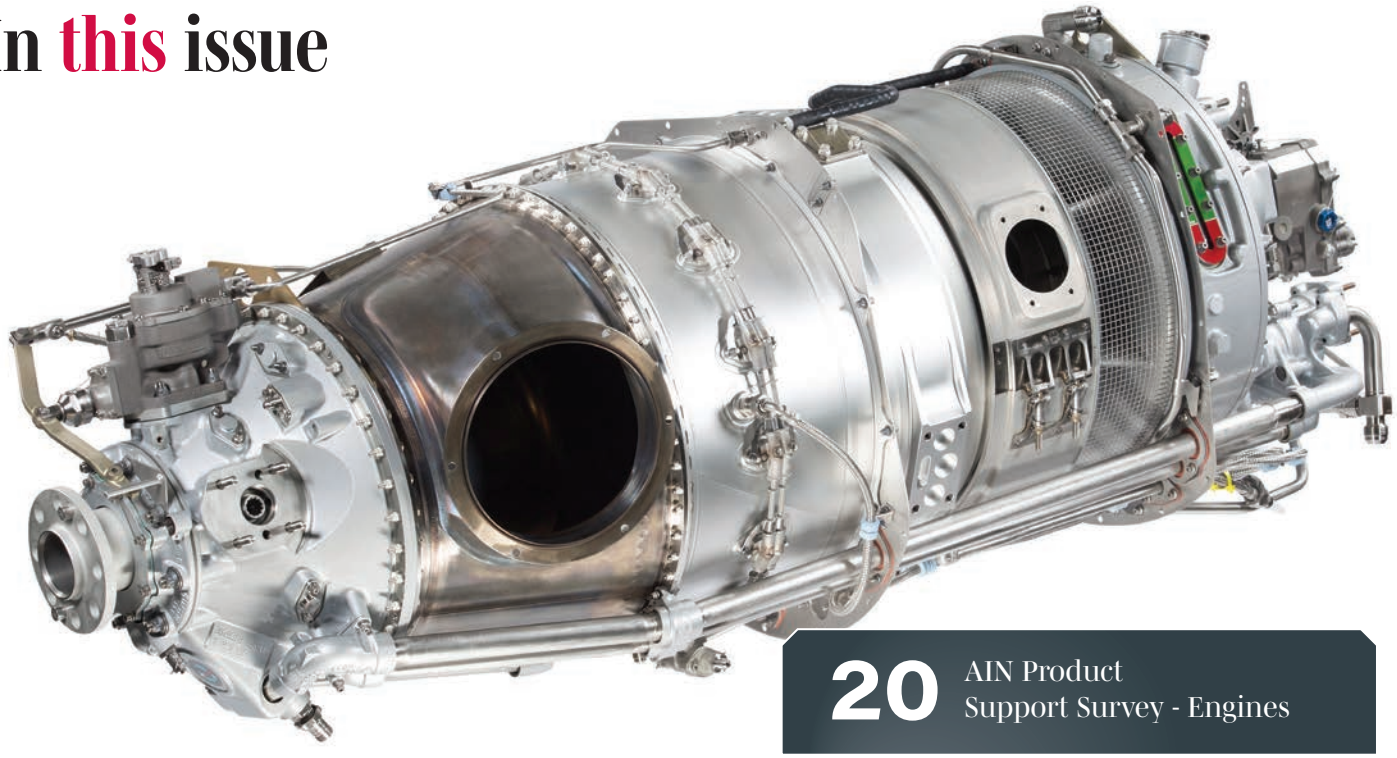

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Rolls-Royce breaks ground on Pearl 10X support facility

BY CHAD TRAUTVETTER

An artist's rendering of Rolls-Royce's new production support facility for the Pearl 10X engine, which will power the Dassault Falcon 10X. The facility will open in the first half of 2023.

On September 2, Rolls-Royce broke ground on a facility in Le Haillan near Bordeaux, France, that will help with production support for the Pearl 10X engine. This turbofan will power Dassault's flagship Falcon 10X, which is set to enter service in 2025.

The new 2,000-sq-m (21,528-sq-ft) production support center—which will house offices, a workshop, and a warehouse—is expected to be finished in the first half of 2023. When completed, it will become part of the global Rolls-Royce product support network.

"While the Pearl 10X engine development program for the Dassault Falcon 10X is making good progress, we are already working in parallel on establishing the infrastructure to support Dassault's flight-test activities and its production line," said Rolls-Royce senior v-p for Dassault products Philipp Zeller. "This new facility will further strengthen our partnership with Dassault, and it will ensure the delivery of the class-leading customer support already associated with the name Rolls-Royce."

> "This new facility will further strengthen our partnership with Dassault, and it will ensure the delivery of the class-leading customer support already associated with the name Rolls-Royce."

Meanwhile, Dassault recently said 10X major structures and systems are under construction and that aircraft detailed design is nearly complete. The first all-composite wing for the 10X is in final assembly and ready for testing at Dassault's Bordeaux-Mérignac factory. First engines and avionics are also undergoing tests, as are subsystems. All of these will flow into the Mérignac facility, where Falcon 10X final assembly begins next year.

News Briefs

NETJETS ADDS LEASE OPTION

After pausing sales because of overwhelming demand for light jet fractional sales last summer, NetJets created a 25-hour lease program for individuals and businesses on a waiting list. The program is being made available after NetJets began a multi-year investment in more than 175 aircraft, 80 of which are scheduled to be delivered this year. NetJets' newest program guarantees access for 36 months to lease a NetJets aircraft—an Embraer Phenom 300E, Cessna Citation XLS, Citation Sovereign, or Bombardier Challenger 350—for 25 hours of flying time annually.

FAA OKAYS STC PATH FOR AUTONOMOUS FLIGHT SYSTEM

Autonomous aircraft systems developer Reliable Robotics said the FAA has accepted the certification basis for its navigation and autoflight system. This paves the way for the system's supplemental type certification on the Cessna 208 Caravan, providing continuous autopilot engagement through all phases of aircraft operation—taxi, takeoff, cruise, landing, braking, and rollout—with a single pilot on board to handle abnormal procedures. According to Reliable Robotics, the system will help to reduce controlled flight into terrain and loss of control in flight accidents, which are the top two causes of fatal accidents in small aircraft.

NORTH TEXAS FBO'S NEW TERMINAL NOW ACTIVE

Rise Aviation, the sole service provider at North Texas Regional Airport (KGYI), has opened its new 10,720-sq-ft, two-story FBO terminal. It includes a passenger lobby with multiple seating areas, refreshment bar, 12-seat conference room, business center, pilot lounge, quiet room, flight-planning area, on-site car rental, and 1,750 sq ft of tenant suites. The Avfuel-branded FBO has 67,000 sq ft of hangar space and 25 acres of ramp for aircraft parking.

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GAMI secures piston fleet approval for unleaded avgas

BY KERRY LYNCH

The FAA has granted supplemental type certificates (STCs) for the use of the General Aviation Modifications Inc. (GAMI) G100UL high-octane unleaded fuel throughout the piston-powered aircraft fleet.

Under the broad approval, the agency is requiring GAMI to work with aircraft owners to track and report any mechanical issues that may arise from the use of the fuel, as well as to track fuel deliveries to airports. The move followed a review by an independent technical panel that evaluated GAMI's test results and documentation, the FAA said, adding it plans to use the same process for other unleaded fuel candidates as they near readiness for the market.

GAMI first obtained an STC in July 2021 for use of G100UL, initially for the Lycoming engines that power some Cessna 172s. It since worked to expand the approved model list to cover the fleet of spark-ignition piston-powered aircraft and engines.

"This is a big day for the industry. It means that for a lot of our general aviation communities, and especially for a high fraction on the West Coast, relief is on the way," said GAMI co-founder George Braly.

General aviation groups, which have coalesced under the government-industry Eagle initiative to step up the urgency in bringing unleaded avgas to market, lauded the FAA fleet approval. General Aviation Manufacturers Association president Pete Bunce called the approval a significant milestone and said, "Manufacturers look forward to having an opportunity to understand the composition and performance of this new fuel to support commercialization and use," he said.

GEORGE BRALY
CO-FOUNDER, GAMI

"This is a big deal," said Aircraft Owners and Pilots Association president Mark Baker. "It's vital that we find solutions to what has been plaguing general aviation since the 1970s."

However, Baker added that "there is a lot of work yet to be done." The timing for the delivery of G100UL remains uncertain. Avfuel is standing by to help manage logistics and distribution, Braly said, adding he is open to other partnerships.

"Our arrangement is that any qualified refiner or blender of existing aviation fuels will be eligible to produce and sell it subject to the quality assurance requirements that the FAA has approved," he said. "It's going to take a while to manage the infrastructure including manufacturing and distribution."

Distribution will be limited initially. The National Air Transportation Association estimated full ramp-up could come in 2024 and newly appointed president and CEO Curt Castagna said the association is working on guidance and training for the supply chain.

In addition to GAMI, Swift Fuels, Afton/Phillips66, and Lyondell/VP-Racing are testing high-octane unleaded avgas candidates.

News Briefs

MISSISSIPPI FBO WORKER STEALS, CRASHES KING AIR

Cory Wayne Patterson, a line service technician at Tupelo Aviation for the past 10 years, stole a fully-fueled Beechcraft King Air C90 around 5 a.m. on September 3. He then circled Tupelo for several hours, at one point threatening to crash the aircraft into a large retail store, causing the building to be evacuated. As fuel ran low, he issued an apologetic social media post saying he "never actually wanted to hurt anybody" and finished with "goodbye." Patterson crash-landed the King Air in a nearby field around 10:20 a.m. Unharmed by the rough landing, the man was arrested and charged with grand larceny and making terroristic threats.

SMARTSKY ACHIEVES 100% CONTINENTAL U.S. COVERAGE

SmartSky Networks' high-speed, air-to-ground (ATG) broadband network is now available across the entire continental U.S., the company announced August 31. With STCs complete for several popular business aircraft models, SmartSky's partners are installing the company's hardware on individual and fleet aircraft. Additional STCs for more aircraft types are nearing completion with the FAA, SmartSky added.

VOLATO LAUNCHES AIRCRAFT MANAGEMENT DIVISION

Fractional HondaJet operator Volato has launched its own aircraft management division following the integration of its purchase of Houston-based aircraft management and charter provider Gulf Coast Aviation earlier this year. Volato Aircraft Management Services will specialize in HondaJets, as well as select large-cabin jets and Beechcraft King Airs. It will provide owners with capabilities such as crew staffing, payroll, maintenance, hangarage, and reservations. Aircraft can also be entered into the company's Part 135 charter operation.

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GAMA: jet and turboprop deliveries climb in first half

BY CURT EPSTEIN

Business jet deliveries increased 9.5 percent in the first half of 2022, bolstered in part by Textron Aviation's delivery of 15 additional jets year-over-year, including eight more Citation Latitudes.

General aviation aircraft billings rose by more than 5 percent to $9.1 billion from $8.6 billion, while business jet deliveries increased by nearly 10 percent in the first half of 2022 compared with the same period last year, according to statistics from the General Aviation Manufacturers Association (GAMA).

OEMs delivered 289 business jets in the first half, paced by Textron Aviation, which improved its previous total by 15 additional aircraft deliveries equating to a 20 percent increase year-over-year. The Wichita airframer handed over eight more Citation Latitudes than it did in the first half of last year. Cirrus also increased the output of its single-engine SF50 Vision Jet by seven over last year, for a total of 30, and Honda Aircraft added four units to its 2021 total.

European manufacturers also showed improvement. Dassault more than doubled its output in the first half of the year. The French airframer did not disclose the types of the 14 jets it delivered in the first six months but they accounted for a 133 percent increase over the previous first half. Pilatus handed over 19 of its PC-24 light jets through the first six months of 2022 compared with 15 the year previous.

Bombardier delivered five fewer of its Global family, resulting in an 11 percent reduction overall. The Canadian OEM ended Learjet production earlier this year, with the final three aircraft coming off the assembly line.

Savannah-based Gulfstream improved on its super-midsize G280 by three through the first six months of this year, but among its large cabin aircraft, it was five units off last year's pace for a total of 47 deliveries. Embraer saw four fewer aircraft deliveries compared with the first half of 2021, a 12 percent decrease.

TURBOPROPS

The turboprop market saw a boost of 11.8 percent compared to the first half of 2021. The higher-end, pressurized segment saw just one additional delivery from its first-half 2021 total of 95 aircraft.

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News Briefs

SAF BLENDER'S TAX CREDIT CLEARED FOR TAKEOFF

U.S. Congress passed the Inflation Reduction Act, clearing the way for a blender's tax credit for sustainable aviation fuel (SAF), providing a key incentive to spool up production, according to business aviation advocates. Aviation leaders were pleased with the inclusion of SAF in the incentives, saying the moves align with their priorities of reducing carbon emissions. The bill provides credits of up to $1.75 per gallon, on a sliding scale, for SAF that meets certain lifecycle greenhouse gas reduction thresholds. The credits extend through 2027.

FREEFLIGHT SHIPPING 5G-RESISTANT RADALT

The FAA has granted technical standard order (TSO) certification of the 5G-tolerant FreeFlight Systems RA-5500 and RA-6500 Terrain-series radar altimeters. The RA-5500 is a single unit system, while the RA-6500 is for dual installations. Under development since 2019, the Terrain-series radar altimeters were designed to prevent interference from C-band 5G cellular telecommunications systems. The new radar altimeters are available for airline, business and general aviation, military, and uncrewed aircraft, as well as rotorcraft.

ARGUS ROLLS OUT BIZAV ANALYTICS SERVICE

Argus International has launched a new analytics service to help support business aviation companies and their strategic initiatives. Under Argus Analytics, the company provides one-on-one sessions with an analyst as part of a customer's ClearView subscription. "ClearView with Argus Analytics supports operators by giving them access to our global data, as well as our analytics specialists who are experts in capturing complex data streams and crafting them into valuable, meaningful reports," Argus said.

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Castagna to succeed Obitts as NATA head

BY CURT EPSTEIN

Timothy Obitts will end his nearly three-year run as president and CEO of the National Air Transportation Association (NATA) on September 1. He will be succeeded by past NATA board chair Curt Castagna.

A member of NATA's staff since 2014, Obitts served as its COO, executive v-p of business operations, senior v-p of business, and general counsel before following Gary Dempsey as president in February 2020. In addition to helping his constituency navigate the uncharted waters of the Covid pandemic, he helped initiate the promotion and expansion of sustainable aviation fuels by encouraging the adoption of book-and-claim programs and by providing guidance to FBOs, airports, and other aviation businesses wishing to reduce their environmental impact. Obitts will continue to champion aviation sustainability as chief legal officer for Alder Fuels.

In the decade since James Coyne stepped down as head of the organization after 18 years at its helm, NATA has named five successive presidents. This latest transition follows a plan NATA set up several years ago to "leverage the experience and dedication of its members to drive strategy and effect meaningful change in the industry."

A six-year NATA board member, Castagna is a business veteran who serves as president and CEO of California-based aviation real estate development and management firm Aeroplex Group Partners. He is the current chair of the Los Angeles County Airport Commission, president of the Van Nuys and Long Beach airport associations, a member of the American Association of Airport Executives, and a private and instrument-rated pilot.

CURT CASTAGNA
NEW PRESIDENT AND CEO OF THE NATIONAL AIR TRANSPORTATION ASSOCIATION (NATA)

> "I am passionate about the aviation business industry and want to do all I can to further NATA's mission to empower the safety and success of its members."

"My initial focus will be the advancement of the association's membership and staff through personal and professional development, collaborative initiatives, and opportunities for increased industry awareness and engagement," Castagna told **AIN**. "I am passionate about the aviation business industry and want to do all I can to further NATA's mission to empower the safety and success of its members." He also noted that new legislation in evolving areas such as alternative fuels and unleaded aviation gasoline requires constant focus by the organization.

News Briefs

WHEELS UP REVENUES GROW

Wheels Up recorded second-quarter revenues of $425.5 million, up 49 percent from the same three-month period last year, but also posted net losses of $92.7 million, an increase of $63.8 million from second-quarter 2021. The air charter operator attributed the higher loss to increased operating costs, supply constraints, and equity-based compensation expenses. CFO Todd Smith said the company expects to achieve profitability in 2024. Also during the quarter, Wheels Up saw its active members surge 20 percent year-over-year, to 12,667.

AVIONICS SALES INCREASE FOR 8TH CONSECUTIVE QUARTER

Second-quarter and first-half 2022 general and business aviation avionics sales continued to increase, according to the latest Aircraft Electronics Association's Avionics Market Report. In the April to June period, sales climbed 19.9 percent, to $708.6 million, from the same three months last year. For the first six months of the year, sales totaled $1.3 billion, up 15.8 percent from the first half of 2021. This increase was mostly driven by sales of forward-fit avionics—installed by OEMs during production—which climbed by 36.5 percent, to $727.5 million, from a year ago. Retrofit sales were down by 1.2 percent, to $615.6 million, during the same period.

AEG FUELS ANNOUNCES BRANDED DEALER NETWORK

AEG Fuels has launched AEG Connect, its branded dealer network. Members include National Jets at Fort Lauderdale-Hollywood International Airport, Boston Executive (Norwood Airport), Kansas Jet Center (Manhattan Regional Airport), Legacy Jet Center (Tulsa International Airport), SkyPlace FBO (San Antonio International Airport), US Aviation Jet Center at Florida's Space Coast Regional Airport, and five of Brazil's TAM Aviação Executiva locations.

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TITAN Aviation Fuels

Michael Graham: SMS can work for small ops

BY KERRY LYNCH

Michael Graham became the 45th member of the National Transportation Safety Board on Jan. 3, 2020, bringing with him a deep background of military and business aviation operations and safety expertise. Beginning his career as a U.S. naval aviator flying A-7s and F/A-18s, Graham also spent more than two decades with Textron Aviation, most recently as director of flight operations safety, security, and standardization. He has chaired the Air Charter Safety Foundation (ACSF) as well as led the NBAA Safety Committee's Single Pilot Safety Working Group.

Graham recently spoke with **AIN** about his transition to the Safety Board and his thoughts on risk management and safety management systems (SMS).

Michael Graham brought a background in SMS to the NTSB.

Q. Tell us about your move to the NTSB and how your work at Textron Aviation and ACSF has played into your role there?

A. It seemed like a good opportunity for me, a good next step in my career. It also seemed like a great idea to have somebody on the Safety Board with a background in business aviation and the charter industry. With my background also including military, general aviation, and manufacturing, I've done a lot of work in safety management systems over the years. I think that is a strength that I brought to the board, SMS and risk management. SMS is not just for aviation, but it works in all of the modes, whether it's rail or marine, or trucking fleets.

Q. From the Safety Board perspective, what are you seeing as far as trends with business aviation?

A. I think you'll hear from not just board members, but a lot of our investigators, that we're not seeing any new accidents out there. It's a lot of the same thing over and over again. A lot of operators are not managing their risk and a lot of them don't have SMS. That's why we've been pushing this really hard since 2016. We put it on the [NTSB] Most Wanted list in 2021 with a focus on not just 135, but any passenger revenue-carrying operation. There's a lot of 91 out there—whether it's air tour, skydiving, parachuting, living history flights, or even hot air ballooning. The paying public deserves the same safety and risk management that we're seeing in the 121 world and the same with 135 operators.

We see in these accidents time and time again, that risk management is not there. They're not identifying the hazards and the risk. They may have good policies and procedures in place, but operationally they're not assuring that those policies and procedures are being followed. A lot of times there are known risks that aren't being eliminated or mitigated. That's why we call on SMS. It comes from the top, but SMS engages every single employee.

Q. What are some of the barriers for operators to adopt SMS and risk management?

A. I think there's a misconception that it's going to be very time-consuming. It's going to be a lot of work that's going to be wasted and it's going to cost a lot. We need to get that perception erased in the industry. In my perspective, it's not costly and difficult. It could be very simple, especially for small operators.

There's a lot of concern because we all know that the FAA is probably getting close to a notice of proposed rulemaking on this, and I think there's a lot of concern that it's just going be a blanket Part 5 [regulations addressing SMS for Part 121]. Unfortunately, there's not a lot of good information on what scalability looks like [under Part 5].

That's why I have focused on and talked about what SMS for a smaller operator could look like. We've not only called for SMS to be required and verified for effectiveness by the FAA, but we've asked for the FAA to give some guidance to the smaller operator on what an SMS would look like. I think it's the fear of the unknown that is scaring a lot of these operators.

continues on page 48 ›

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AIN's 50th anniversary look back: October

BY CURT EPSTEIN

AIN is celebrating its golden anniversary by highlighting select news from the archives over the past half-century.

Beech treks to outer limits with bold new Starship 1


Tuesday
NBAA Convention News
Beech treks to outer limits with bold new Starship 1
Gates raises curtain on its t-prop future

(NBAA Convention News October 4, 1983 p.1)

Then: With buzzwords such as "jetfan," "tipsail," and "tandem wing," Beech Aircraft president and CEO Linden Blue rocked the business aviation community yesterday with official announcement of the firm's oft-rumored high-tech turboprop, dubbed "Starship 1."

A serious rival to Luke Skywalker's "Star Wars" fighter in appearance, the radical eight-to-ten passenger, canard configured twin pusher, first of what Blue described as "a family of airplanes...which will lead the industry for the next 20 years," is scheduled for FAA type certification under FAR Part 23 by late 1985.

Now: Beech backed up that announcement at NBAA's 1983 convention with a flying demonstration by the 85 percent-scale proof-of-concept model over the static display at Dallas Love Field, which stopped traffic and dropped jaws. The Starship achieved certification in 1988 after a protracted campaign, but despite the project's cost, which tallied in the hundreds of millions of dollars, never achieved the lasting fame its designers and supporters envisioned. Factors such as increased weight to satisfy certification requirements, new production processes that added to its pricetag, and perhaps even the aircraft's unconventional appearance served to dampen market interest.

The company produced only 53 Starships and succeeded in selling less than a dozen, with the remainder offered for lease. One later company president noted, "there would be no more airplanes that look like Klingon battle cruisers." The majority of the fleet was rounded up by the manufacturer and disposed.

Pressurization failure suspect in fatal Learjet 35 accident


NOVEMBER
Aviation International News
Boeing supersizes its bizjet with a 25-percent larger BBJ2
Pressurization failure suspect in fatal Learjet 35 accident
$28M shortfall delays WAAS further, retards LAAS & new GPS frequencies

(AIN November, 1999 p.1)

Then: Once again, the death of a high-profile personality in the crash of a private aircraft has focused the public's concern and speculation about the safety of "small planes." It happened to the small GA airplane industry when JFK Jr crashed in his Piper Saratoga earlier this year. Now it's happening to the business aviation community as a result of last month's crash of a Learjet 35 in which pro golfer Payne Stewart and the five other people on board were killed.

Now: Air traffic controllers lost communication with the jet about 15 minutes after it took off from Orlando, Florida, on Oct. 25, 1999 on a planned flight to Dallas. The NTSB report concluded that it suffered a loss of pressurization for "undetermined reasons," rendering all aboard unconscious as the Learjet climbed to cruising altitude. The jet flew on autopilot for about four hours until it ran out of fuel and crashed in a field in South Dakota. The NTSB report showed that the airplane had undergone maintenance related to cabin pressure several times in the months leading to the accident, but the Safety Board failed to determine whether a common problem led to the need for the parts replacements and repairs.

DayJet finally takes off

Then: On October 3, per-seat, on-demand air-taxi firm DayJet marked its official grand opening in a ceremony at the Tallahassee (Florida) Regional Airport. DayJet flew "several dozen" revenue trips for a limited customer base in the two weeks before the official launch to ensure a smoother roll-out. DayJet has 1,500 business travel members who can book point-to-point flights among the initial five Florida DayPorts-Boca Raton, Gainesville, Lakeland, Pensacola, and Tallahassee-aboard DayJet's Eclipse 500s.

Now: Conceived amid the heady optimism surrounding the introduction of aircraft such

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DayJet finally takes off

AutoPower
From takeoff to touchdown

SAFE FLIGHT

(AIN November 2007 p.16)

as the Eclipse 500 and the Citation Mustang, which evoked images of skies darkened with clouds of very light jets, DayJet survived less than a year before a lack of funding forced it to shut down and ground its fleet of 28 Eclipse 500s. The company had expanded from Florida to destinations throughout the southeast, but troubles surfaced when it was unable to secure another $40 million of operating capital, forcing it to ground some aircraft and begin to lay off staff. These problems exacerbated struggles Dayjet faced with trying to keep the nascent jets airworthy in a high-utilization environment. Last-ditch efforts to save the company failed, forcing it to declare bankruptcy in November 2008.

DayJet's collapse also had serious ramifications for Eclipse Aviation as the now-defunct operator accounted for 1,429 of the airframer's once-claimed backlog for 2,700 EA-500s. Soon after the announcement, Eclipse told **AIN** that it had removed those orders from its order book, leaving the OEM with orders for "fewer than 1,000" copies of the VLJ. Having spent more than $1 billion to develop and certify the EA-500, it declared bankruptcy itself in 2009, several months after DayJet, amidst an economic landscape cratered by the global financial meltdown.

AMI certificate revocation spooks charter industry

Then: AMI Jet charter's trouble with the FAA didn't start on October 12, when the agency revoked AMI's charter certificate, nor the week before when it suspended AMI's certificate, nor in March when the FAA began an investigation of AMI or even in September 2005 when the Department of Transportation fined AMI $250,000 for violation of foreign-ownership regulations.

According to the FAA, AMI's problems began in 1998 when TAG Aviation USA, which is owned by Switzerland-based TAG Aviation Holding bought part of Aviation Methods, a Burlingame, California, charter/management company that then became AMI Jet Charter.


Aviation International News

AMI certificate revocation spooks charter industry

Serious questions about ADS-B NPRM arise

(AIN November 2007 p.1)

Now: AMI, one of the largest Part 135 operators in the U.S. with 79 airplanes was essentially forced to shut down after the FAA determined that TAG was exercising operational control over AMI flights. According to the agency neither TAG Aviation USA nor its parent TAG Aviation Holding of Switzerland had authority to fly charter trips.

TAG Aviation USA eventually agreed to pay a $10 million fine as part of an FAA settlement, which allowed the sale of AMI's assets and orderly transfer of aircraft without interference. In January 2008, it was acquired by Sentient Flight Group.

Bombardier axes Learjet 85, bizjet deliveries flat in Q3

Then: Bombardier ended months of speculation about the fate of the Learjet 85 when it confirmed on October 29 that it has formally cancelled the program. The decision comes a year-and-a-half after the all-composite midsize business jet first flew, in April 2014. When the company "paused" the program in January, the sole flight-test Learjet 85 had logged more than 70 flights.


Bombardier axes Learjet 85, bizjet deliveries flat in Q3

Political maneuvering rescues languishing Ex-Im legislation

(AIN December 2015 p.26)

Bombardier Business Aircraft cited "lack of sales following the prolonged market weakness" in its decision to cancel the program. "Although this is a difficult decision given the years of effort and hard work put into the program, it is the right decision given the market dynamics for this segment," said Bombardier president and CEO Alain Bellemare.

Now: Bombardier pulled the plug on the Learjet 85 a year and a half after the midsize jet made its first flight. The all-composite 85 would have been the largest aircraft produced under the Learjet brand and had amassed 64 orders when the manufacturer first paused the program in January 2015. Analysts at the time pointed to the overstretched research and development agenda and the severe cash shortage Bombardier faced.

The cancellation turned out to be the beginning of the end for the venerable Learjet brand that helped usher in the private jet concept starting in the 1960s. In February 2021, Bombardier announced it would close down the Learjet line, and this March, the company delivered its final Learjet 75, ending 60 years of production.

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POINTS AFTER TOUCHDOWN

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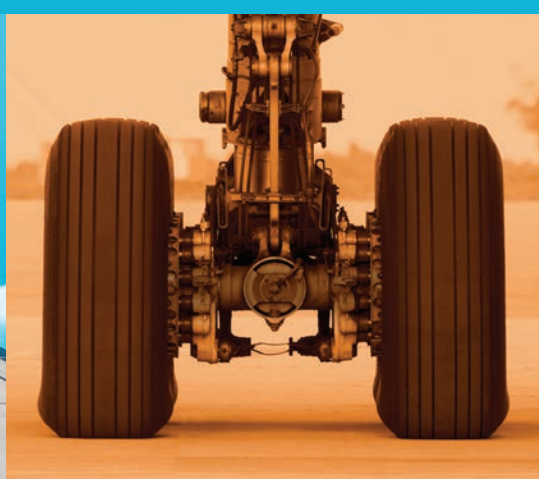

POINTS AFTER TOUCHDOWN

FACE SLICK RUNWAYS WELL PREPARED

Wet or contaminated runways will test your approach brief's quality. What's needed is a strong knowledge of runway braking action and landing distance factors, coupled with a crew primed to execute the plan with precision.

- Tailwind landings to wet runways have led to excursions and are best avoided.
- Most landing distance tables assume all stopping tools fully in use 2 sec. after touchdown. Achieving that requires precise crew coordination.
- Pre-identify a 'wheels-on-ground-by' reference on/near runway and go around if you'll float past it.
- Stay alert after weather. Standing water may persist after rain ends and the sun melting top layer of snow or ice can degrade braking action.

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Who is responsible for wake vortex avoidance?

BY STUART "KIPP" LAU
AIRBUS PILOT, SAFEETY EXPERT

Wake turbulence can be a threat on any flight. Every aircraft, both large and small, generates wake turbulence as a function of creating lift. Wake turbulence vortices can vary in strength, duration, and direction and if encountered can cause a loss of control in-flight event or accident. The trick to surviving a wake turbulence encounter is to avoid it altogether.

Under IFR flying, wake turbulence avoidance is accomplished by air traffic controllers applying minimum separation standards based on each aircraft's class, as determined by size or aerodynamic characteristics. Separation may be accomplished by assigning specific speeds (distance and time) or altitudes to be flown. Pilots are expected to fly the speed and altitude assigned by controllers to maintain this minimum separation.

A pilot accepting a clearance to visually follow a preceding aircraft accepts the responsibility for traffic separation and wake turbulence avoidance. This is a common scenario for a wake turbulence encounter when pilots accept a clearance for a visual approach behind landing traffic. In this case, the pilot must maintain separation both vertically and horizontally from the preceding aircraft.

According to the Aeronautical Information Manual (AIM), the most common hazard of a wake turbulence encounter is associated with induced rolling moments that can exceed the roll control authority of an aircraft. In rare cases, the wake encounter can cause catastrophic in-flight structural damage.

An in-flight wake turbulence encounter close to the ground is almost always fatal. Wake turbulence encounters at higher altitudes can only be mitigated through proper and appropriate upset recovery training.

Business jets are not immune from wake turbulence encounters. Notable examples include two fatal wake turbulence encounters—where separation was lost behind a large airliner during the approach phase of flight—and a more recent wake turbulence encounter during cruise that resulted in a serious in-flight upset.

> "Eh, he's pretty close. [A few minutes later] A little too high on the ah...I don't know, looks kinda close."

In the first example, an Israel Aircraft Industries 1124A Westwind on a visual approach lost wake turbulence separation with the preceding aircraft, a Boeing 757-200. Both aircraft were executing visual approaches to the John Wayne Airport in Santa Ana, California.

Prior to the accident, the pilots of the Westwind were instructed by ATC to follow the Boeing 757, reduce speed to follow, and were cleared for the visual approach to Runway 19R. At this point, the Westwind was 3.3 nm behind the 757 on a converging course.

Roughly, 20 seconds later, the first officer told the captain, "Eh, he's pretty close." The captain responded, "Okay, I'm, ah, let's go flaps twelve," followed by, "I got him, okay we can do it—no problem."

Approximately 35 seconds after being cleared for the visual approach, the Westwind was instructed to contact the tower. Upon initial check-in with the tower, the tower controller advised the Westwind that the 757 was indicating 30 knots slower. At this point, the Westwind had closed to about 2.2 nm behind the 757 passing through 3,700 feet. This exchange with ATC was the last recorded radio transmission by the accident aircraft.

Over the next 30 seconds, the Westwind's CVR recordings indicated the completion of the landing checklist and the first officer's concerns about the glide path of the 757, stating, "A little too high on the ah..." and the distance between the two aircraft saying, "I don't know looks kinda close."

The last radar returns from the Westwind indicated that it was at 1,100 feet and 2.1 nm behind the 757. Witnesses reported seeing the aircraft on final approach and then suddenly pitching down and rolling about its longitudinal axis and crashing. The two pilots and three passengers were killed.

According to the NTSB, the probable cause of the accident was the pilot in command's failure to maintain adequate separation behind the 757 and failure to remain above its flight path, which resulted in a wake turbulence encounter.

Another wake turbulence encounter involved a Bombardier Learjet 45 that crashed on approach to Mexico City International Airport, killing all nine aboard the light jet and seven on the ground. The accident report from this event determined the crash was the result of the Learjet flying too closely behind a Boeing 767-300ER.

At the time of the accident, the Learjet was 4.1 nm behind the 767. But the minimum allowable distance for the lighter aircraft to follow the "heavy" jet is 5 nm.

Contributing to the accident was the flight crew's delay in slowing the Learjet as instructed by ATC. Controllers issued a speed reduction, but it took more than a minute for the pilots of the Learjet to respond.

At the time of these ATC instructions, the Learjet was overtaking the 767 by approximately 80 knots. Likewise, the pilots during the arrival used a descent technique—stepping down rather than a continuous descent—that placed the Learjet's vertical flight path below the path of the 767.

Investigators determined that the Learjet entered a violent wake turbulence vortex that rolled the aircraft over and pitched the nose down at an altitude (1,700 feet agl) that was too low to recover.

Less common, but more survivable, are wake turbulence encounters during the cruise phase of flight. In January 2017, a Bombardier Challenger 604 lost control as it flew beneath an Airbus A380. Pilots of the Challenger told investigators that the wake turbulence from the A380 caused their aircraft to lose 9,000 feet and roll through "several rotations."

As described in the report, the pilots experienced a "temporary loss of control" about one minute after the A380 passed overhead about 1,000 feet above the Challenger in Indian airspace over the Arabian Sea. At the onset of the wake turbulence encounter, the Challenger rolled to the left and several flight deck displays and related systems failed, as did the left engine due to a temperature exceedance.

After the upset, the crew declared an emergency and diverted to Muscat International Airport in Oman. Two passengers were seriously injured and two other passengers and the flight attendant received minor injuries. The aircraft was substantially damaged, and Bombardier said the aircraft "could not be returned to an airworthy state."

> "Avoid the area below and behind the wake-generating aircraft. Especially, at low altitude where even a momentary wake encounter could be catastrophic."

Back to the AIM, as a reminder, the wake turbulence vortex strength is determined by an aircraft's weight, speed, wingspan, and shape of the wing. The vortex strength increases proportionally to an increase in operating weight or a decrease in aircraft speed. The greatest vortex strength occurs when the generating aircraft is heavy, clean, and slow—this is problematic in the terminal area when following a larger aircraft.

Of importance, the AIM stresses, "Avoid the area below and behind the wake-generating aircraft. Especially, at low altitude where even a momentary wake encounter could be catastrophic." This is critical because wake turbulence vortices settle below the path of the wake-generating aircraft.

Other wake turbulence avoidance tips from the AIM: when following a larger aircraft, it is important to stay above the larger aircraft's final approach flight path and land beyond its touchdown point. And on parallel runways (closer than 2,500 feet), be aware of the potential for the vortex to drift over your runway.

Other avoidance procedures relate to landing behind a larger departing aircraft—in this case, note the point that the larger aircraft rotated and landed well before that point. Likewise, if departing behind a larger aircraft, attempt to rotate prior to its rotation point and climb above its flight path.

A review of air traffic wake turbulence separation requirements is a great place to develop your own minimum acceptable distance to be flown behind a larger aircraft. As an example, a small or large aircraft behind a heavy aircraft requires a minimum of 5 nm of separation.

Pilots should use tools such as TCAS displays to improve situational awareness and define the minimum distance when following a larger aircraft. Additionally, situational awareness can only be improved by listening up for the "heavy" callsigns.

The explosion of e-commerce has added a lot of bigger cargo jets to the U.S. National Airspace System, often operating at smaller airports. Cargo airlines such as Atlas ("Giant"), Air Transport International, FedEx, UPS, and Kalitta almost exclusively operate heavy jets or Boeing 757s that have nasty wake turbulence characteristics.

Pilots should develop strategies to avoid wake turbulence and have a plan to recover from an inadvertent encounter. Developing a strategy for avoidance involves a deep understanding of wake turbulence vortex generation, strength, behavior, and operational problem areas (for example, near the ground).

Likewise, being knowledgeable on avoidance procedures—especially those outlined in the AIM—and pilot responsibilities, including the acceptance of visual approaches, will help mitigate the risk of a wake turbulence encounter.

The opinions expressed in this column are those of the author and not necessarily endorsed by ***AIN*** *Media Group.*

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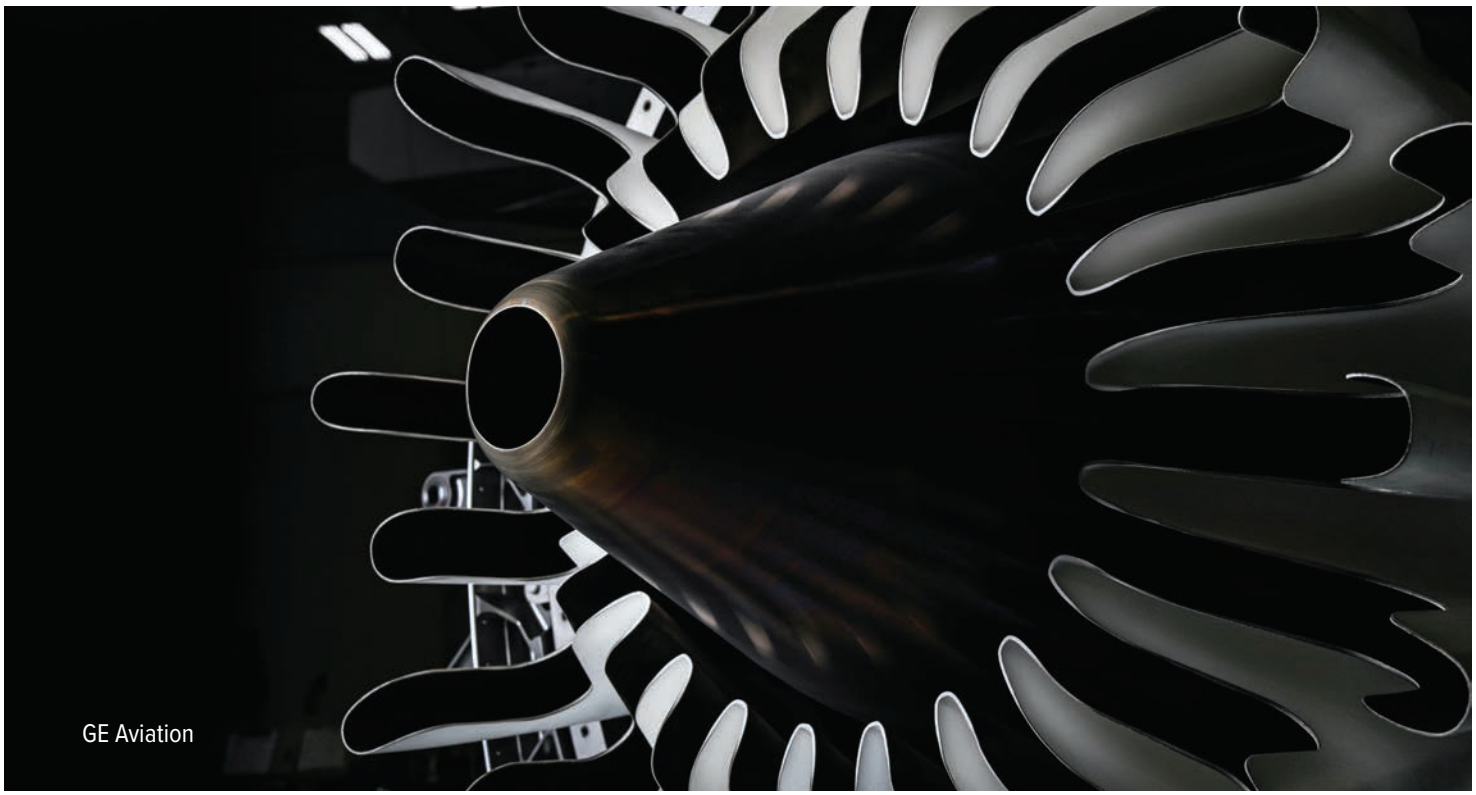
AIN Product Support Survey 2022

Part 3: Engines

BY MARK HUBER



GE Aviation

An Overall Average improvement to 8.7 from 8.5 (out of 10) last year was enough to push GE Aviation to the top of this year's **AIN** Engine Product Support Survey. The ratings of all other OEMs fell from last year, largely a factor of Covid-related supply chain and personnel problems. Honeywell appeared to take the biggest hit in this regard, with its Overall Average dropping to 7.6 from 8.2 last year, making it the only OEM to finish with an Overall Average of less than 8.0. Honeywell executives told **AIN** that the company is acutely aware of these issues and has embedded its personnel with key suppliers in an effort to unsnarl the bottlenecks and address related issues, including AOG times.

Williams International finished a strong second, with an Overall Average of 8.6, driven by top marks in the Cost of Parts, AOG Response, Technical Manuals, and Technical Reps categories. Pratt & Whitney and Rolls-Royce tied for third-place with an 8.3 Overall Average. Rolls-Royce shared a 9.4 Overall Engine Reliability rating with GE. GE and Williams both rated 9.0 or better when it came to the key metric of Warranty Fulfillment.

Not surprisingly, the Cost of Parts and Parts Availability drove down the scores of OEMs, but Overall Engine Reliability ratings remained strong for everyone, with nine out of 10 engines surveyed posting reliability ratings of 9.0 or better. GE Aviation and Rolls-Royce topped that category with a reliability rating of 9.4 each, driven in large part by the continued strong performance of GE's 8,000-strong fleet of legacy CF34 turbofans and the Rolls-Royce Tay, first introduced in 1988, that powers many legacy large-cabin Gulfstreams, including the GIV.

For turboprop and turboshaft engines, Pratt & Whitney continues to dominate, with an Overall Average of 8.5 in each category. However, the company's Overall Average for turboshaft engine support on helicopters dropped from 8.7 last year.

SURVEY RULES AND METHODOLOGY

The objective of the annual Product Support Survey is to obtain from the users of business jets, pressurized turboprops, and turbine-powered helicopters statistically valid information about the

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Category & Overall Average Ratings for Aircraft Engines	Overall Average 2022	Overall Average 2021	Rating Change from 2021 to 2022	Cost per Hour Programs	Parts Availability	Cost of Parts	AOG Response	Warranty Fulfillment	Technical Manuals	Technical Reps	Overall Engine Reliability
Turbofan Engines											
GE Aviation	**8.7**	8.5	0.2	**8.7**	7.8	7.6	8.2	**9.4**	9.0	8.8	**9.4**
Williams International	8.6	**8.8**	(0.2)	8.1	8.0	**7.8**	**8.3**	9.0	**9.1**	**9.2**	9.2
Pratt & Whitney	8.3	8.5	(0.2)	7.9	7.7	6.9	7.8	8.6	8.3	8.4	9.1
Rolls-Royce	8.3	8.5	(0.2)	7.3	**8.4**	6.8	**8.3**	8.6	8.0	8.5	**9.4**
Honeywell	7.6	8.2	(0.6)	6.9	6.7	6.2	7.1	8.1	7.4	7.6	8.8
Turboprop Engines											
Pratt & Whitney	8.5	8.5	0.0	8.4	8.5	6.6	8.3	8.9	8.8	8.9	9.3
Turboshaft Engines											
Pratt & Whitney	8.5	8.7	(0.2)	8.0	8.4	7.3	8.3	8.8	8.6	8.6	9.1

Ties listed alphabetically by OEM.

product support provided by airframe, avionics, and engine manufacturers over the last year. The goal is to encourage continuous improvement in product support throughout the industry.

SURVEY TOOL

For the second year, the survey was conducted via a questionnaire developed in partnership with Rolland Vincent Associates, a Texas-based consultancy focused on aviation market research, strategy, and forecasting. The survey was created to provide improved ease of use and to encourage more participants to complete the entire survey. The survey tool:

» Included Spanish and Portuguese versions.
» Asked respondents to evaluate one full aircraft at a time including airframe, engines, and avionics.
» Included clearer language and imagery around the individual categories and the evaluation scale.

METHODOLOGY

AIN emailed qualified readers a link to the password-protected survey website, which was open from April 25 to June 10. Respondents were asked to rate individual aircraft and provide the tail number, aircraft age, primary region of service, and whether they used factory-owned or -authorized service centers, or both. Respondents were also asked to rate, on a scale from 1 to 10, the quality of service they received during the previous 12 months in the following categories (for engines): Cost Per Hour Program; Parts Availability; Cost of Parts; AOG Response; Warranty Fulfillment; Technical Manuals; Technical Reps: Overall Engine Reliability.

THE RESULTS

In total, 674 unique participants from 58 countries completed the survey, representing 1,793 aircraft and 141 aircraft models.

AIN noticed a decent decrease across the board in survey responses after an increase last year. Rolland Vincent Associates reviewed the data to ensure accurate and valid responses. The data specialist also compiled the final survey results in close coordination with **AIN**.

Respondents were also asked to recognize individuals who have provided them with exceptional product support and service. Select individuals are highlighted in this report.

RESULTS ANALYSIS

In analyzing the results of this survey, this year's scores were generally lower than last year and even slightly lower than 2019 scores. Our thoughts on this are:

» The survey period last year asked about May 2020 to May 2021, when certain business aviation segments flew considerably less than usual. The May 2021 to May 2022 survey period was almost the exact opposite, with all business aviation segments flying more than pre-pandemic years. More flying leads to more unscheduled maintenance and demand on support teams.
» Supply chain issues most likely created challenges in getting parts in a timely fashion to keep aircraft flying.
» The post-pandemic time has seen an influx of new aircraft owners and operators that may have different service expectations.

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GE AVIATION

GE Aviation has jet engine offerings for small, super-medium, large-cabin, and long-range business jets including the HF120 on the HondaJet, the CFE738-1B on the first-generation Dassault Falcon 2000, the CF34-3 on the Bombardier Challenger 600 series, and the Passport on the Bombardier Global 7500. The CF34 tied for the top Overall Average engine rating at 8.6. The company offers enrollment product support through its OnPoint program. Melvyn Heard is the president of the company's business aviation programs.

The Passport is the company's newest business jet offering and is installed on more than 150 aircraft in service. Heard said that approximately 85 percent of Global 7500 customers are enrolled in OnPoint. The fleet has amassed 100,000 flight hours and 40,000 flight cycles. For all customers, the Passport is supported by a staff of 20 on a mobile repair team, which is able to deploy anywhere in the world, and an additional 20 field service representatives. Throughout GE Aviation's business engine offerings, the company works with 45 service support partners.

Category & Overall Average Ratings for Aircraft Engines	Engine Model	Overall Average 2022	Overall Average 2021	Rating Change from 2021 to 2022	Factory Owned Service Centers	Authorized Service Centers	Cost per Hour Programs
Turbofan Engines							
GE Aviation	CF34	**8.6**	8.5	0.1	8.2	8.7	**8.8**
Williams International	FJ44	**8.6**	**8.8**	(0.2)	8.5	**8.9**	8.0
Rolls-Royce	BR700 series	8.3	8.5	(0.2)	8.5	8.7	7.2
Pratt & Whitney	PW500 series	8.3	8.5	(0.2)	8.6	8.6	8.0
Rolls-Royce	Tay	8.3	8.6	(0.3)	**9.3**	**8.9**	7.0
Pratt & Whitney	PW300 series	8.1	8.6	(0.5)	8.3	8.7	7.7
Rolls-Royce	AE3007	8.0	8.6	(0.6)	8.1	8.1	7.4
Honeywell	TFE731	7.9	8.3	(0.4)	8.6	8.7	6.8
Honeywell	HTF7000	7.5	8.1	(0.6)	8.2	8.6	7.2
Turboprop Engines							
Pratt & Whitney	PT6A	**8.6**	8.5	0.1	8.8	8.6	8.4

Engines listed received the minimum number of responses for inclusion. Ties are listed alphabetically by engine model.

The Intelligent Solution to Fractional Ownership Now Makes More Sense than Ever

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SPECIAL ADVERTISING INSERT 2022

The fractional aircraft ownership community has changed dramatically in the nearly 30 years since PlaneSense introduced its "intelligent solution" for shared ownership, built on a unique and compelling value proposition and the then-new Pilatus PC-12 single-engine turboprop platform.

"Nobody knew these airplanes," recalled PlaneSense, Inc. founder and CEO George Antoniadis, describing his decision to build the fractional program around the Swiss aircraft as "a leap of faith." But Antoniadis—an air transport-rated pilot who holds an MBA from Harvard and an electrical engineering degree from Zurich's Federal Institute of Technology—recognized the potential revolution that the big, modern, and comfortable turboprop represented for the fractional arena.

Since PlaneSense launched in 1995, major fractional brands have ridden booms and survived near collapses and ownership programs large and small have come and gone. With its all-Pilatus fleet, meanwhile, Antoniadis' company has followed its founding vision and values, consistently growing while forging unrivaled client loyalty and creating a legacy of stability, longevity, and trust.

Now, amid an unprecedented surge in demand, supply-chain disruptions, and increasing attention to sustainability, the PlaneSense vision and values resonate more strongly than ever, amplified by the completion of a slate of major service initiatives. Among them: the addition of the PC-24 light jet to the company's fractional fleet; installation of high-speed Wi-Fi aboard all its aircraft; and expansion to full Continental U.S. service coverage with the elimination of the last out-of-area fees.

Like many flight providers, PlaneSense has been challenged by the current environment. In early 2022, it deferred sales of new shares through the end of the year to focus on meeting commitments to existing clients, while adding infrastructure for planned growth. That included expanding staff by 25 percent since the pandemic began and creating a maintenance center in Las Vegas to support West Coast operations. Now, with sales of shares in the PC-12 and PC-24 set to resume in the fourth quarter, Antoniadis took time during a rare non-travel day to talk about what he sees as the keys to the program's success and what the company is doing to maintain its edge.

A PLATFORM, AND A VALUE PROPOSITION

Today, the PC-12 and the PC-24 are among the most coveted business aircraft, either turboprop or jet, whether for on-demand access, or to purchase new or preowned. Yet Antoniadis believes the PlaneSense value proposition is as important to the program's success as the aircraft its clients fly on. The proposition is built on three pillars: service, flexibility, and cost efficiency, and team members "have a passion to deliver" on all three, he said.

The world-class PlaneSense service is highly attentive and personalized. "Our goal is to excel in long-term relationships," said Antoniadis, and the company keeps "a razor-sharp focus on clients' needs."

PlaneSense operates two maintenance facilities to ensure quality and consistency across the fleet.

Flexibility comes from the ability of the PC-12, and now the PC-24, "to get people closest to their destinations," with performance that opens access to thousands of airports that most business jets cannot use.

The cost-efficiency pillar rests on having "the most economical aircraft in its class" in both the six-place Pilatus turboprop and the eight-place jet, combined with the fleet optimization enabled by PlaneSense's unparalleled experience with the platforms, as the world's largest civilian operator of both models.

"I call it the double economy of scale," Antoniadis said. "You're buying only as much aircraft as you need, but the whole asset shows up—that's the first economy. The second economy is our system: the assets are highly utilized, keeping the operating costs per hour extremely low and the overhead costs minimal."

These pillars are what Antoniadis believes makes PlaneSense the intelligent solution for shared ownership. "You can walk away at the end of the flight and pat yourself on the back, knowing you chose the right program."

RELATIONSHIPS, NOT TRANSACTIONS

The three pillars are also the foundation for the stability, longevity, and trust that characterize the company's relationships—not only with clients, but with team members and key partners, as well.

"We are relationship-focused, not transaction-focused," Antoniadis emphasized. He noted that PlaneSense does not offer a "most-favored-nation" contract clause that guarantees a client

the lowest available terms, simply because equal terms for all is a core company principle. "You don't need to be looking behind your back to see who got a better deal," he said. "We commit that the transaction we're entering with you is fundamentally the same as the previous one, and the next one."

George Antoniadis, President & CEO, founded PlaneSense in 1995 with a desire to provide better solutions for private flights.

Illustrating the trust and stability that it engenders, even with the large growth in their numbers over the past decade, almost one-quarter (24 percent) of the company's clients have owned PlaneSense shares for 10 years or longer. Some original shareowners remain with the program, and today the children and even grandchildren of some of them own shares as well, Antoniadis noted with both astonishment and pride.

Of course, excelling at long-term relationships requires meeting clients' evolving needs, such as desires "for more capacity and speed," which led the company to become the launch customer for the PC-24 twinjet, Antoniadis recounted.

Introduced in 2014, the PC-24 light jet offers outsize performance and advanced features that prompted Pilatus to proclaim it the "Super Versatile Jet." It's worth recalling that when the order book opened at the European Business Aviation Convention and Exposition that year, the first two years of production—84 PC-24s—sold out before the show ended. PlaneSense ordered six and inaugurated service with Serial #101, the first ever PC-24, in 2018. By the end of 2022, the fleet will include 11 PC-24 jets.

With safety and quality at the forefront of its operations, PlaneSense developed a robust in-house training program for pilots and maintenance technicians.

An emphasis on relationships is also reflected internally. "I like that we have a family feeling," Antoniadis said, noting that a significant number of the staff "have enjoyed working here for 20-plus years."

Pilots, meanwhile, have a choice of more than 40 locations to base from, where they can live the lifestyle that suits them best.

"Our team members are people, with names, families, and aspirations, and we make sure that all of them are valued for who they are," he said.

The same approach applies to key suppliers. "Instead of spending energy trying to eke out a better deal somewhere, we spend it on creating deep relationships," Antoniadis said.

ONE SOLUTION FOR ALL

Though some business aircraft travelers consider fractional ownership out of reach, Antoniadis believes PlaneSense changes the calculus, making it the best option even for many who have jet cards, use charter, or own an aircraft outright—not only for current fractional customers seeking a smarter solution.

As for whole aircraft ownership, "It's terribly cost-inefficient, unless you fly 300, 400 hours a year," he noted. Meanwhile, chartering one's aircraft out to generate offsetting revenue "creates a barrier to your own use," he said. "The reason you own a whole airplane is so that you can fly whenever you want. Once others are using the plane, you're removing that flexibility from yourself."

For jet card customers, PlaneSense "might be a higher upfront investment, but if you calculate the entire cost, it's much more economical," Antoniadis said. Moreover, while a blizzard of blackout dates and restrictions can impact costs and access at many card programs, "We have far fewer restrictions than average," he said.

Another distinction between PlaneSense and jet card programs: "It's a different kind of interaction and service," Antoniadis said. "PlaneSense is an extension of your coming home."

And for customers who currently charter and those new to business aviation, "Why compromise?" he asked rhetorically. "Come to the best service solution, which also turns out to be one of the most cost effective over time."

THE TOOLS FOR TOMORROW

Going forward, PlaneSense will remain true to its vision and values, Antoniadis said. "We believe in organic growth, and in constantly improving the value of the program for our clients, which results in more clients." Toward that end, he continued, "The more things we can control that are core to our business, the better we can improve the program."

That's why, with safety at the heart of PlaneSense's operations, the company trains all its pilots and maintenance technicians in-house, he said.

"We have more experience with these airplanes than anyone, so we believe we can train our pilots and technicians better than anyone."

The PlaneSense leadership team.
(left to right)

- Mike Baur, VP Business Development & Strategy
- Robyn Moses-Harney, VP Human Resources
- Jim Citro, CFO & Treasurer
- George Antoniadis, President & CEO
- Gary Arber, VP & General Counsel
- Todd Smith, Director of Air Worthiness, VP Atlas Aircraft Center
- Kevin Gordon, VP Flight Operations
- Dave Verani, VP Sales & Marketing
- Mandar Pendsé, Chief Information Officer

For nearly three decades, the constant exchange between Pilatus Aircraft and PlaneSense has resulted in an incredible knowledge base, which is the foundation for training, maintenance, and safety initiatives at PlaneSense.

The pilot training center at the company's Portsmouth, New Hampshire headquarters is equipped with customized flight training devices commissioned from FlightSafety International (FSI), and a full-motion PC-12 NGX simulator for the facility is under construction.

Full maintenance operations have been part of the service strategy since the company's inception in 1995. To ensure quality and safety, the majority of maintenance is performed by highly trained technicians at the expansive, state-of-the-art hangar at the company headquarters in Portsmouth, NH as well as a second facility in Boulder City, NV, added in 2021 to service the increasing flight volume in the Western U.S. and supplement the workload normally handled by Portsmouth.

In addition to robust in-house training, A&P maintenance technicians take part in training through the individual manufacturers, including Pilatus.

Meanwhile, to create the next step change in efficiency, the company is developing with thought leaders from MIT an optimization tool that amalgamates big data on aircraft, clients, crews, schedules, and other operational keystones, processed through AI analysis. Initial implementation of this project, which began in 2020, is expected by year's end.

Technology is also helping PlaneSense to meet changing client expectations, though those expectations haven't necessarily evolved in ways Antoniadis would have predicted.

"My stated goal when we started the company was that a human would always answer the phone, and it wouldn't ever take more than four rings," he said of his customer service policy. But today, he observed, "People prefer to press soft buttons on their cell phones and not talk to anyone. It does take away from the human touch that I have always thought is so important, but that's the new status quo. So, we're constantly developing enhancements on our app and portal so clients can do more that way."

› GE Aviation continued

GE is seeing an even higher enrollment rate, approximately 90 percent, of its HondaJet GE Honda Aero Engines HF120 customers who fly the 500 engines for that aircraft. That fleet recently surpassed the 250,000-hour flight mark. Also this year, GE is celebrating the 30th anniversary of the first delivery of its CFM34 series of engines for Bombardier's Challenger 600 series and regional jets, with more than 8,000 of those powerplants delivered since 1992.

"Coming out of Covid has allowed us to be a lot more engaged with our customers, to actually get out and be with them, continue our training requirements with them, and create new tools to engage them like remote training and workshops," Heard said.

"With the geographic restrictions that were in place through Covid, we still wanted to have that engagement to keep our customers up to date with training requirements. So we came up with a new series of video webinars to update our customers on how to maintain their fleets, prognostics tools to actually trend monitor the engines and proactively push out reports and customer notifications. We're able to see things trending on the internet even before our customers do, and being able to get their information in their hands so they can take proactive actions ahead of time." Heard said dozens of onboard engine sensors and GE's analytics allow it to be "a lot more surgical" on the maintenance solutions it recommends, giving customers "the right actions they need to do at the right time."

Heard said GE Aviation also took a proactive approach to any potential Covid-induced supply chain disruptions. "We've done a great job of looking around the corner and understanding the challenges we are facing across the aerospace industry. It drives us to have a lot deeper discussions with our supplier base, not only with our direct suppliers, but tier two suppliers to make sure we understand where the capacity concerns are right now." But Heard assured that GE had "ample supply within our supplier base right now. There's no commodity's status actually driving us to be concerned right now."

Category & Overall Average Ratings for Aircraft Engines	Engine Model	Parts Availability	Cost of Parts	AOG Response	Warranty Fulfillment	Technical Manuals	Technical Reps	Overall Engine Reliability
Turbofan Engines								
GE Aviation	CF34	7.7	7.7	7.9	**9.3**	**9.1**	8.6	9.5
Williams International	FJ44	8.0	**7.8**	8.3	9.0	9.0	**9.2**	9.2
Rolls-Royce	BR700 series	8.4	6.8	**8.4**	8.7	7.9	8.6	9.4
Pratt & Whitney	PW500 series	7.9	6.6	7.8	8.5	8.3	8.4	9.4
Rolls-Royce	Tay	**8.7**	6.8	**8.4**	7.8	7.4	7.8	**9.7**
Pratt & Whitney	PW300 series	7.6	7.0	7.8	8.4	8.1	8.2	9.0
Rolls-Royce	AE3007	7.8	6.6	7.7	8.2	8.3	8.5	9.0
Honeywell	TFE731	7.3	6.2	7.4	8.0	7.7	7.9	9.4
Honeywell	HTF7000	6.4	6.2	7.0	8.1	7.3	7.4	8.2
Turboprop Engines								
Pratt & Whitney	PT6A	8.5	6.6	8.3	8.9	8.8	8.9	9.3

Engines listed received the minimum number of responses for inclusion. Ties are listed alphabetically by engine model.

WILLIAMS INTERNATIONAL

Williams International's fleet of turbofan engines is now approaching 7,000 FJ44 and FJ33 engines with more than 18 million hours of flight time. The engines are installed on airframes including the Cessna CJ series, Beechcraft Premier, Cirrus SF50, and Nextant remanufactured light jets. The FJ44 tied for top Overall Average with a score of 8.6

Customers can enroll in the Williams TAP Blue program for maintenance through approved service centers. Overall fleet enrollment in the TAP program is currently more than 85 percent.

"As with much of the world, we too are suffering from supply chain constraints," said Williams's Steve Shettler, senior vice president of product support. "This creates a headwind on our factory for new engines and parts for maintenance in our repair station. We are making all efforts to mitigate the effects of this global issue on our customers, continue to rapidly expand our operations, and vertically integrate the production of our components so we can circumvent many of the supply chain snarls and uncertainty

that otherwise delay deliveries and spare parts. This methodology will allow for continued growth in the future so we can fully support our customers, OEM's, and operators alike."

PRATT & WHITNEY CANADA (P&WC)

P&WC's PT6 turboprop Overall Average rating inched up by .1 to 8.6, one of the few engines to notch an improvement. The company recently simplified its pay-per-hour (PPH) engine maintenance contracts and added new features.

P&WC's oil analysis technology uses artificial intelligence (AI) and machine learning to increase predictive and preventive maintenance capabilities for helicopter engines. Oil analysis technology is included as part of the Eagle Service Plan (ESP). Its Spare Engine Solutions enable customers to extend the life

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› Pratt & Whitney continued

of an aircraft or get a parked aircraft back flying with solutions tailored to the flying hours needed. Short-term engine rental is available to customers while their engine is in the shop for scheduled or unscheduled maintenance.

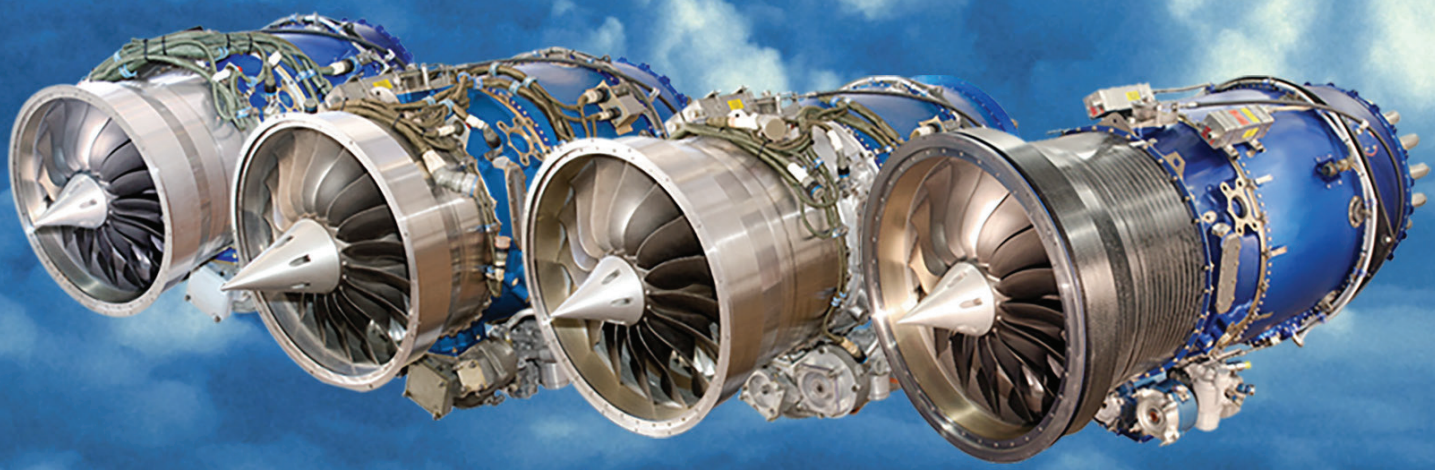
The company also expanded its portfolio of P&WC Smart solutions for major maintenance events. The first new offering under the category is the P&WC Smart subscription service for PT6A engines that provides selected scheduled and unscheduled maintenance coverage, parts replacement, and digital engine health services for engines between their hot section inspection (HSI) and overhaul. The service is tailored for operators in the post-HSI stage of the engine lifecycle and not on an engine maintenance program and provides a bundle of ongoing engine maintenance, services, and support through an annual subscription. P&WC Smart also offers flat-rate new and zero-time since overhaul engine exchanges. The aircraft is on the ground for only as long as it takes to swap the old engine for an updated model.

P&WC also offers a service guarantee program for the PT6E-66XT engine on the new Daher 960 that leverages engine operating data to provide proactive support, including unscheduled events. ESP platinum coverage on the PT6E-67XP now includes full foreign object damage (FOD), including any wear and tear or other required repairs discovered during a FOD repair. This means customers no longer must make a separate claim to their insurance as FOD events are typically covered through insurance policies.

P&WC has 50 owned and designated maintenance facilities, 100 field support managers, more than 100 mobile repair team technicians, more than 1,000 spare engines, and 10 owned and designated parts distribution centers worldwide. In November, it expanded its designated maintenance facility (DMF) network, appointing Jet Aviation operations in Singapore; Cairns, Australia; Hong Kong; Manila, Philippines; and Basel, Switzerland. This brings the number of DMFs worldwide to 22.

ROLLS-ROYCE

Overall, the company's business aviation engines enjoy a 99 percent dispatch availability and it is posting record enrollments in its CorporateCare family of engine support programs, according to Andy Robinson, Rolls-Royce senior vice president for services, business aviation. Robinson said new service plan enrollments, which had been running at about 150 per year, already stood at between 350 and 400 through midsummer. "It is the best year we have ever had," he said. To support its growing business aviation engine fleet, the company has added new technicians in Europe and North America. Real-time engine health monitoring for plan enrollees means that Rolls-Royce can dispatch parts and personnel to the aircraft without the customer becoming



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› Rolls-Royce continued

mired in the purchasing process. "It's a much slicker process, which means greater aircraft availability," he said.

The company also has made significant investments in digital, launching a new customer portal, the Yocova marketplace, where customers can buy services online directly from the company. "This collaboration platform gives customers single sign-on access to all of the capabilities and services and features that we provide. That includes engine health monitoring and new technical publications," said Robinson.

The company's new engine vibration HUMS monitoring unit on the Pearl engine measures 10,000 parameters, delivering "a very comprehensive insight into the engine performance," Robinson said. "That enables us to be more proactive and possibly find upcoming issues before they even take place, and what that does is effective. It is something that we've introduced with the Pearl [engine]. It's a groundbreaking piece of technology. We're working closely with the airframers because it's mounted in the airframe and coupled to both engines," he said.

Using Opus10 software, Rolls-Royce can now predict the quantity of each spares component the company should have on hand and at which of its global parts stores in Singapore, Dubai, Frankfurt, the UK, Beijing, Indianapolis, Wichita, or Los Angeles. Robinson said the company has been fortunate with its supply chain and has experienced minimal disruptions.

"We haven't really been hit with major parts shortages," Robinson said, while acknowledging that the company has devoted personnel, but not direct investment, to its suppliers.

Using Opus10 means the company can ship the right part from the right parts store to minimize any customer downtime and eliminate invoicing for plan enrollees. Rolls-Royce uses continually updated heat maps to track the activities of each store and customer location. "I'm driving teams to have the right parts in the right regions."

Like its competitors, Rolls-Royce is paying particular attention to the labor market and how it impacts product support. "I think what the industry is suffering with is a shortage of people. It's the people shortages that are [disrupting] the turn time. It is not where it should be. There's a shortage of technicians, there's a shortage of people globally," Robinson said.

HONEYWELL

Honeywell understands there is work to be done, particularly with regard to the support of its newer series of HTF7000 turbofans, which posted an Overall Average drop to 7.5 from 8.1 last year. It is also dealing with increased AOG volume and adding agents to its AOG team based at Phoenix Sky Harbor

› Honeywell continued

airport who sit "side-by-side" with technical support agents to help customers troubleshoot both online and in real-time.

The company's product support executives told **AIN** that supply chain challenges are "very real" and that Honeywell is taking extraordinary measures to address them, dedicating the full-time attention of 25 senior leaders—at the senior director and vice president levels—to Honeywell's 95 "most challenging suppliers." It is also investing capital, engineering, and sometimes additional manpower resources in these suppliers and ensuring that Honeywell's demand forecasts reach sub-tier suppliers 18 months ahead of time so they can ramp up to meet that demand.

Honeywell is also working to identify serviceable material and components on the open market and purchase and refurbish these for its inventories via its Honeywell Aerospace Trading (HAT) teams. The company has hired an additional six HAT team buyers and increased inventories by 20 percent. Items purchased for inventory include whole engines and APUs that are being placed in rental pools. Making refurbished parts and components available to customers does not necessarily reduce prices, but it does allow the aircraft to be returned to service faster.

Supply chain challenges

› Honeywell continued

have forced Honeywell to reevaluate its engineering, portal strategy, and digital footprint to enable customers to be better able to self-serve and troubleshoot. The company has also posted a number of YouTube videos in that regard. Company executives expect the supply chain to largely normalize by year's end, with mechanical components recovering first.

Honeywell is leveraging engineering resources to address supply chain issues as well, evaluating detailed parts that go into repairs to determine what can be reused as opposed to replacing with new, a practice it characterizes as "a big enhancement for us." The practice has created a larger engineering presence in all of the company's shops that "historically wasn't there."

Longer-term, Honeywell is addressing manpower challenges by conducting hiring fairs across the country at various schools that offer airframe and powerplant technician training, offering candidates attractive relocation packages and competitive compensation.

Overall enrollments in the company's Maintenance Service Programs remain strong and the Honeywell continues to hone its digital offerings to enhance customers' predictive capabilities.

SAFRAN HELICOPTER ENGINES

Today, 50 percent of Safran Helicopter Engines' customer base has either a support-by-the-hour contract or a Global Support Package (GSP).

In 2021, Safran Helicopter Engines said it guaranteed "full continuity of activity and unmatched availability of assets and spare parts with no disruption whatsoever." An investment in internal repair capabilities with the expansion of Safran's Tarnos, France plant has translated into turnaround repair times that have been halved since 2019, said the company, which did not receive enough responses in the **AIN** survey to receive a ranking.

Safran's front office teams at 12 different sites focused on answering customer needs along with its network of service partners and certified distribution and maintenance centers. The company continues to engage users via customer councils in Europe, North America, Australia, and Japan. Large customers continue to subscribe to Safran's support-by-the-hour (SBH) programs including the very first SBH on the Arrano engine with Japanese operator ANH but also with the German Bundespolizei (for their Arrius 2F engines on the H120), Saab (for the Swedish Armed Forces' Arrius 2K2 on the Leonardo AW109), and Air Greenland (for the Arriel 2C2 on the Airbus Helicopters H155).

In the coming months, Safran will accelerate its support of the Arrano engine for the Airbus H160 and its customers

continues on page 41 ›

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Charting a secure flight path through threatening skies

BY JAMES WYNBRANDT

Safety has long been business aviation's holy grail, but today that priority encompasses a growing range of risk issues, while also becoming entwined with the community's expanding security component. The threats are real.

On the ground, publicly available real-time flight tracking data provides aircraft ownership details and "actionable information that could be used by anyone with any kind of intent, be that good, bad, or otherwise," creating identifiable security risks, said Doug Carr, NBAA senior v-p of safety, security, sustainability, and international operations.

As connectivity enters the cabin, "The cybersecurity threat increases, and the attacks are getting more and more sophisticated," said Josh Wheeler, senior director of client services at Satcom Direct, adding that as bandwidth increases, "The risk profile just gets greater."

Concurrently, healthcare issues have morphed into security concerns.

"A medical event in a high-risk location could very quickly turn into a security issue or vice versa," said John Cauthen, security director of aviation and maritime at medical and security services consultancy MedAire.

All this in a threat environment where simply observing traditional safety standards impels some owners and operators today to outfit their business aircraft with anti-missile defense systems.

Meeting the security challenge properly is a complex, multidisciplinary imperative, tailored to the risks an organization or individual faces. It's not a "set it and forget it" endeavor, say security experts, but an evolving approach—just as threats evolve—and must be periodically tested. Fortunately, a wealth of resources, solutions, best practices protocols, and other security assistance is available to help counter these largely invisible, but identifiable threats.

THE PRIVACY SECURITY LINK

A right and expectation of privacy have long been a bedrock of business aviation's operating principles, whether to shield confidential corporate activities; protect individuals from potential physical dangers, or a simple desire for anonymity. The FAA's aircraft registry complicates privacy rights right by making the identity of U.S.-registered aircraft owners public through an easily

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accessible resource and potential security vulnerability that is unique.

"A public registry of aircraft in other parts of the world just does not exist," said Carr.

When airborne, the identifying information is transmitted by ADS-B Out transponders and dutifully displayed by the FAA for internal use and shared with subscribers—flight tracking services and others—which also disseminate and display the data, allowing anyone to quickly identify the owner and track their flights.

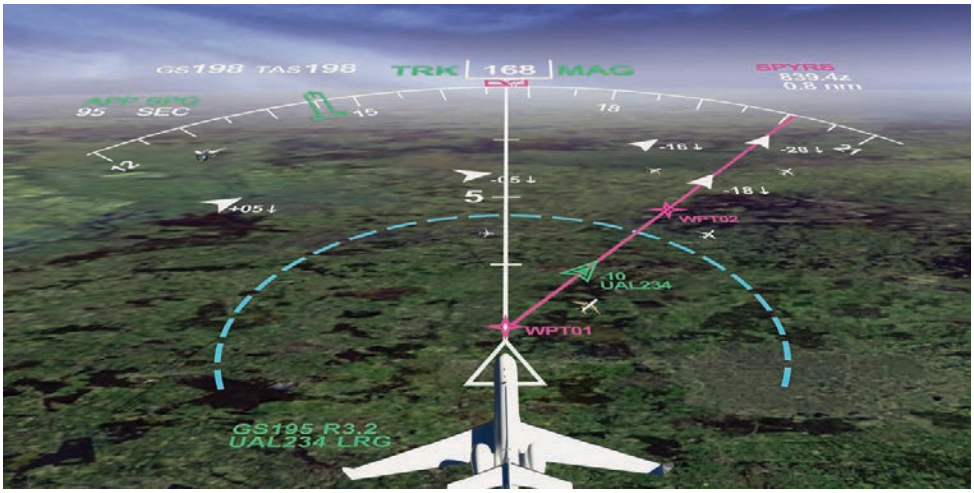
This is in contrast to automobiles—an oft-cited comparison—whose owners can't be identified by simply looking up a car's license plate on a phone app or be tracked in travels around the neighborhood or across the country. Thus, aircraft ownership entities are often structured behind a trust or shell corporation to obscure the owner's identity.

Business aviation's privacy concerns came into greater focus when the FAA, early in the last decade, tried to shutter the Block Aircraft Registry Request (BARR) program, which shielded real-time flight tracking identification information of enrolled aircraft from public disclosure. Security consultants testified at congressional hearings on the risks presented by unblocking the data, and the FAA ultimately retained BARR until it was replaced in 2020.

Two FAA programs today allow owners to block or limit the tracking identification information: the Limited Aircraft Data Displayed (LADD) program; and Privacy ICAO Address (PIA) program. Security experts recommend enrolling in both.

LADD AND PIA

LADD is the successor to the BARR program, enhanced for the ADS-B era, and implemented on Jan. 1, 2020, in conjunction with the deadline for ADS-B-out transponder equipage. Aircraft enrolled in BARR were automatically transitioned into LADD. New applicants can request LADD online, or via e- or snail mail, and the application is simple and straightforward.



Ubiquitous ADS-B information makes tracking aircraft relatively easy.

Under LADD, third-party vendors that subscribe to FAA feeds (flight-tracking networks and service providers such as MROs or management companies) must block the public display of any aircraft registration or call sign that is participating in the program and ensure they do not publicly display historical data of those aircraft.

Enrollees can select vendors authorized to receive their information, though this functionality is still in development.

When airborne, the aircraft's type, altitude, airspeed, and flight plan information will appear on flight tracking displays of blocked vendors but call signs or tail numbers will be absent.

But today, other entities outside of the FAA-authorized vendors—ranging from privately owned networks to tracking enthusiasts—also can obtain ADS-B transmission information directly from aircraft, complete with their identifying data. The LADD program doesn't block these trackers from gathering or disseminating the information.

The PIA program is designed to plug the gap by providing operators with a temporary Mode S transponder identification—a non-published, six-digit ICAO hex code—that replaces the aircraft registry information from the FAA's civil aviation registry that would otherwise be attached to an aircraft's transponder signal. When airborne, an anonymous flight ID number—which operators must also secure for the program—will appear on flight tracking displays in lieu of the aircraft's tail number.

But applying for and maintaining PIA coverage is more complex and time-consuming than LADD enrollment. The FAA has established a 60-day baseline for processing new ICAO hex code under PIA, a relatively long time to not be flying under the radar if security is a concern. Those already in the program who believe their code has been compromised can apply for an expedited replacement, which takes about 20 days.

"Events over the last few months have really highlighted the critical time element when your information has been compromised," said Heidi Williams, NBAA director of air traffic services and infrastructure, citing news coverage of the movements of putative celebrity-owned business jets.

Plans call for a third-party vendor to assume administration of the program this year, which is expected to speed up the current processing time.

Additionally, the aircraft's PIA code will have to be renewed and changed on an ongoing basis, and each code change is considered a maintenance item, requiring a logbook entry, a flight validation, and other compliance work. And PIA applies only to FAA-controlled domestic airspace; flights operating along oceanic routes, even near the U.S. coast and in the Gulf of Mexico, are not shielded at this time, though the

FAA is working with ICAO in an effort to expand the PIA coverage area. Like LADD, PIA is still in development.

But even when fully operational, PIA or LADD cannot ensure anonymity, especially in today's connected world.

"We've had onlookers at the airport who shared all of the goings-on of an operation via social media," said Williams, regarding the source of some recent accounts of celebrity business jets. "That allowed [trackers] to link those operations with a call sign or a tail number, even though [the aircraft owners] had gone through LADD and PIA."

Nor are U.S.-registered aircraft the only ones exposed to private surveilling.

"Most aircraft flying across the globe today are equipped with ADS-B and are sharing the same kind of information and subject to greater analysis," noted Carr at NBAA.

A Twitter account dedicated to tracking (and flight shaming) jets believed owned by European moguls was said to have played a role in encouraging French government officials in August to call for a ban on business jet flights in the country.

It's worth noting that many gawker reports on the flight habits of the rich and famous appear to be under the misapprehension that the aircraft's owner is onboard every flight. Also, what are likely short repositioning legs in the course of charter operations are seen as crosstown jaunts by owners trying to save a few minutes on the freeway.

There's an important privacy corollary to this misunderstanding: charter customers, though they book flights under their own names, have little chance of being identified as onboard a particular flight, whether ownership of the aircraft is public or not, security experts say. Fractional aircraft owners also have this protection, as they rarely fly on the aircraft in which they are registered as owning a share, these experts further note.

No technological fixes or encryption solutions to the aircraft identification issue appear imminent; ADS-B and avionics systems have no on-off switch that would preclude their transmitting identifying data. Potential workarounds under discussion include an international PIA-type program covering the U.S., Canada, and Eurocontrol. "About 40 percent of global air traffic flies between those three chunks of airspace," noted Carr. Domestically, cutting the link that ties certain ICAO Mode S data to a specific aircraft in the FAA registry—a regulatory solution—could also help, according to NBAA.

SECURE CONNECTIVITY

In the air as on the ground, the internet provides access to a variety of malefactors, and in the connected aircraft, the cabin is

typically the focus of attacks. “That’s the biggest point of entry and the most easily compromised,” said Satcom Direct’s Wheeler. “The cyber threat is huge and it’s never going to slow down.”

Most attacks “cast a very wide net, going after low-hanging fruit, in hopes of finding a diamond in the rough,” said Wheeler, trying to capture passwords, usernames, and email addresses, “with the goal of compromising the account or to sell the information.”

Onboard connectivity systems themselves are often unprotected and may be publicly accessible when on the ground.

“No one changes the passwords for the sake of convenience, no one locks down their Wi-Fi,” said Wheeler. “It’s mind-boggling to me that you will have C-level executives that may have trade secrets or proprietary information [accessible], and yet they don’t put a Wi-Fi password on it.”

Experts recommend updating passwords regularly and keeping firmware on devices and routers updated; their upgrades often include fixes for security vulnerabilities.

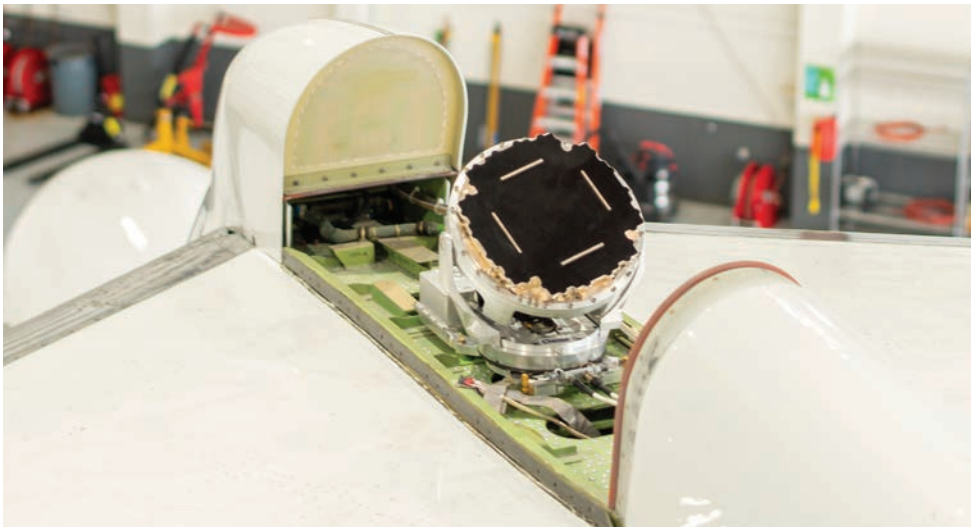
Said Wheeler, “Some things you can easily accomplish are going to exponentially increase your security [protection] profile.”

Satcom Direct can view the devices and apps accessing its routers on customers’ aircraft. “We get visibility to the specific port protocol that they’re trying to exploit,” Wheeler said, and a significant number are compromised: “We’re seeing a lot of malware and a lot of different virus activity.”

Onboard routers themselves can be a vector for spreading this malware, even in the absence of connectivity, said Wheeler.

“It’s not the norm, but [the malware] can propagate [onboard] from one device, and it doesn’t necessarily require internet access to do it.”

Moreover, while the vast majority of attacks are untargeted, Satcom Direct has seen state-sponsored, advanced persistent threats (APTs) targeting “specific assets,” or devices believed connected to an entity or individual.



Satcom Direct protects customers by securing inbound and outbound data on its network.

Major connectivity providers have robust security features built into their services and hardware and can usually tailor additional security features to meet higher demands.

In addition to threat monitoring, Satcom Direct can, for example, encrypt, anonymize, and secure inbound and outbound data through its private network “and on top of that, interrogate for malicious content and events,” Wheeler said.

Connectivity provider Gogo manages and operates its own network through multiple data centers for redundancy and provides Tier 1 and Tier 2 network security monitoring and analysis from its network operations center. All network communication is secured by routing through licensed spectrum using proprietary link encapsulation, and Gogo’s onboard routers and Avance connectivity systems include built-in system intrusion security.

Viasat handles highly sensitive data for the U.S. Department of Defense, using Type 1 encryption devices and systems—the U.S. government standard for handling confidential, secret, or top-secret documents. Its network security monitoring combines signature and behavior-based anomaly detection, analyzing more than 2.4 billion events daily in monitoring the threat landscape.

Advised Wheeler, “Ask your ISP, ‘Where are you sending my data? Do you own your own data center infrastructure? What encryption policies do you have?’ And if you can’t get an answer, I’d say that’s terrifying.”

But basic security protection can’t stop phishing scams coming through passengers’ email or scammers from using social engineering tactics (i.e., making inquiries appear to come from a trusted source) to try gleaning sensitive information, making online behavior another necessary security focus.

Scammers shifted from viruses to phishing schemes during Covid, according to some security professionals, using awareness of the government funds available through the 2020 CARES Act (business aviation companies received more than $640 million from it that year) as bait for scams with links to phony offers of grant money or approvals. Desperation and dreams provided the fuel. “People were looking for financial aid or relief, and it made for some nasty business,” Wheeler said of the resulting scams.

“We cannot determine when a phishing email is sent, however, when (or if) a link within the email is clicked, we see the request out to the malicious site and block the outbound traffic to that site,” he said.

As the persistence and success of such schemes illustrate, smart and cautious online behavior—or on any medium—is important in reducing security risks.

“Does your company have a policy about what employees can or cannot post about

work?" asked NATA Compliance Services communications specialist Claudia Culmone in a recent webinar on cyber attacks. She noted examples of efforts in which scammers tried to gather information about individuals over the phone from corporate flight departments, using information posted on social media accounts to make their inquiries seem legitimate. In a poll, 63 percent of the webinar participants reported their companies have social media policies (25 percent were not sure).

WHERE HEALTH MEETS SECURITY

Meanwhile, real viruses and infections—not the computerized variety—have joined the pantheon of evolving risks.

"Since the pandemic, we've seen a much stronger crossover between security and medical [concerns] than ever before," said Cauthen at MedAire. He cited by example an AOG in an unstable location, where physical safety and personal health could both be jeopardized, complicating and delaying the resolution.

MedAire, a Phoenix-based provider of inflight medical resources for both commercial and business aviation, is a division of International SOS, and both organizations have evolved, now complementing their original medical services with security offerings.

MedAire's basic medical services include real-time in-flight medical emergency assistance to manage and monitor first aid treatment and arranging for medical assistance to meet the aircraft at the most suitable alternate destination. Security services include flight and airspace risk analysis and aviation travel security briefs.

Concurrently, the scope and definition of medical services are also expanding.

"Post pandemic, operators are interested in their crew members' personal overall wellbeing and personal health," said Richard Gomez, v-p of aviation products and solutions at MedAire. "So medical has been transformed from only physical, to mental health and overall wellbeing, and security is not only about the asset of the aircraft, but the asset of the individual person."

As part of its growth in this area, MedAire partnered this year with security services specialist Bond to offer a personal security monitoring service. Intended for use on the ground in situations where clients feel uncomfortable or unsafe but that are not yet emergencies—the so-called "too early/too late" security problem—the service provides instant contact with a personal security agent who can monitor events and summon additional assistance if needed.

Also pursuant to its holistic healthcare approach, MedAire recently introduced an enhanced client portal and added client-facing staff for its "human-centric

operations." The strategy is to address three "legs" as MedAire calls them—a team, technology, and partnerships—to provide a sound model for an organization's security program.

The team approach starts internally by ensuring the flight department communicates with all other company security entities. "Engage on a regular basis as you build new crew policies and flight manuals, and get buy-in from corporate," advised Cauthen. However, he acknowledged that flight operations can be "a bit of a learning curve and an education piece for corporate security professionals."

Wheeler recommends flight departments and operators conduct recurring security audits and training, and "provide a conduit where [team members] can learn more about realistic, tangible threats, versus this abstract concept of cybersecurity."

A host of organizations, NBAA included, offer guidance on business aviation security best practices, including checklists for minimizing risks within flight departments, onboard, cybersecurity procedures, and during aircraft servicing.

Technology provides conduits for learning and keeping team members abreast of evolving threats and countermeasures. But it also offers risk mitigations and solutions, including those capable of meeting risks beyond APTs.

Meanwhile, another aspect of security defenses involves those who are in danger of physical harm. Directed IR countermeasures (Dircoms) are designed to protect aircraft from heat-seeking ground-to-air missiles (also called Manpads). They integrate a thermal camera, mirror turret, and advanced fiber-laser technology able to detect, target, and neutralize these threats. Elbit Systems' Music (Multi Spectral Infrared Countermeasures) family of Dircoms can be installed on large-cabin business jets and transport category aircraft such as ACJs and BBJs (J-Music) and helicopters and turboprops (Mini-Music), though these installations are most common in military aircraft.

The systems are lightweight, compact, and easily installed on a broad range of aircraft, in both single and multi-turret configurations, according to the Israeli company, and can be integrated with various missile warning systems. Completion centers confirmed that they have installed such systems on aircraft.

The SD Pro app gives customers a real-time view of cybersecurity threats.

THE SECURITY PICTURE AHEAD

The security cat-and-mouse keeps heating up. Technologies like 5G and the evolving Internet of Things have reportedly led to increased cyber attacks against critical infrastructure coming from a wider range of perpetrators. Are these threats mirrored on the evolving connected aircraft?

"We have to think outside the box," said Wheeler. "Anything that accesses the internet is susceptible to risk. It's naïve to think that a system is impenetrable."

But, Wheeler and others note, international regulatory authorities and standards organizations "are very cognizant of the next generation" of avionics and communications systems in development, and are establishing design requirements aimed at securing and hardening them.

Agreed MedAire's Gomez, who serves on the Air Charter Safety Foundation's board of governors, "There's an overall heightened awareness and focus on security, and cybersecurity—the industry is looking at all the right things."

The air traffic control system itself—perhaps the most integral player in U.S. aviation safety and security—is getting hardened as a result of the demand for heightened security.

The FAA is adopting a zero trust architecture to shield its systems from cyberattacks. Zero trust philosophy, a driver of the next generation of digital validation tools, assumes that networks are compromised and focuses on defending the application data.

The upgrade effort began under a Department of Transportation program in 2020 but became government-wide policy under a 2021 executive order aimed at strengthening government computer systems and networks. The FAA infrastructure will also have to accommodate cloud technologies embedded in the ecosystem, and forthcoming unmanned aircraft systems and commercial space operations.

A couple of parting thoughts for non-professionals struggling to wrap their organizations around the amorphous concept of security:

"Knowing the solution in place today may not be 100 percent foolproof is as valuable for operators to know as thinking they're protected," said Carr.

And though security and compliance protocols can be perplexing and confusing, "You can't just throw up your hands and say, 'That's not my job,'" said Wheeler. "It's everyone's job."

Finally, advised Gomez: "The mantra is to be prepared for the next event. Because there will be a next event, whatever that might be."

› Safran Helicopter Engines continued from page 32

including ANH in Japan, PHI in the U.S., and the French Navy. More than 200 people are trained to deliver MRO services on the engine. In parallel, Safran also plans to support the entry into service of the Leonardo AW189K super-medium twin that is powered by Aneto 1K engines, which were certified at the end of 2019.

New digital services, including the My Engine Dashboard and Logbook Viewer, have been added to Safran's EngineLife family of services, which already encompasses health monitoring and Web IETP (interactive electronic technical publications) that provide online access to all technical documentation. "We have also improved online navigation and introduced 3D illustrations to ensure ease of use" for Safran's Web IETP, which is now fully integrated with the company's online ordering system, enabling customers to directly confirm and order parts for a specific task. Safran has worked with Airbus, and this function is available on the Arrano Web IETP with a direct link to the H160 Orion documentation.

ABOVE & BEYOND

Kevin Moore (**Rolls-Royce**)
"He is a very knowledgeable, accessible, fight-for-the-customer rep."

Jiri Huml (**Honeywell**)
"We are always glad to work with Jiri Huml. He is doing a very great job and is always effective. His communication and attitude are a very good example to all OEM customer support teams."

Noe Garza (**Pratt & Whitney Canada**)
"Noe is a wonderful liaison between tools, spares, warranty, and all other divisions of PWC."

Dave Newton (**Dallas Airmotive**)
"He goes beyond any other on helping you."

TAG Aviation still an aircraft services force

BY CURT EPSTEIN

When TAG Aviation Holding sold its assets in 2019 and 2020 and divested from the aviation industry, some may have thought that would be the end of the legacy brand. But its core aircraft and charter management businesses—which were sold to its Asian joint-venture partner Young Brothers Aviation and another private investor—have continued the TAG Aviation name.

"It's the same TAG logo, the same heritage, the same legacy," said Steven Young, CEO of TAG Aviation and president of the company's Asia division. As one of the founding shareholders of TAG Asia, he has had a stake in the company for the past 16 years. "There was no shareholder exchange, there was a shareholder adjustment. In other words, I continued with my shareholding, I just increased it."

STEVEN YOUNG
CEO OF TAG AVIATION AND PRESIDENT OF THE COMPANY'S ASIA DIVISION

TAG holds AOCs from the UK, Malta, San Marino, and the Cayman Islands, and manages a fleet of approximately 80 mainly large-cabin, long-range business jets split evenly between Asia and Europe. Most of them remained with the company after the TAG Aviation Holdings break up.

In a rare interview, Young, who is now the majority shareholder in TAG Aviation Group, told **AIN** that while the company has been relatively quiet over the past two years, it has been busy behind the scenes. "During that time we've focused on restructuring the business part of it to be more efficient and to have greater harmony between our Asia and European operations," he said. "We're generating greater efficiencies between the two organizations in terms of personnel, operating methods, and training and development of our people, which is our greatest asset here."

Young is based at the company's Hong Kong office, which is its Asia headquarters. Over the past two years business there has been slow in the wake of the global pandemic. "As you can imagine, the environment out of our control has placed great restrictions on our business, and that continues through today. Although, it is gradually being lifted," he said. "We've increased our presence in Singapore; they're fully opened up. We have to go where the activity is and at this time, due to the Covid environment, it's in Southeast Asia."

He does however see improvement there. "People are beginning to travel because of the loosening of restrictions, so over the next six to twelve months, we see improved activity. We're quite positive about the future," he said. TAG also offers AOG support and authorized maintenance for Bombardier and Dassault at its Hong Kong facility, as well as at its FBO in Macau.

In Europe, with the elimination of Covid restrictions, the company has seen a surge in charter activity.

One unusual feature, which the company instituted five years ago, is its own ab initio pilot training program. Conducted by TAG's wholly-owned Flight Training Adelaide in Australia, the program offers selected TAG employees who have been with the company for at least five years the opportunity to obtain their pilot certificate and earn type ratings to fly for the company. The first cadet to pass through the program has already earned her Global type rating and pilots a TAG-managed airplane. Limited to one or two candidates a year, the fully-subsidized program has several more trainees in the pipeline.

In terms of company growth, Young takes a more circumspect view. "TAG has never been about being the biggest," he said. "We focus on the pursuit of excellence in everything that we try to do, so that could be your service delivery, it could be safety in your operations, everything. So, with that mindset and culture, we take a cautious and steady approach to anything that we do."

FBOs feel the labor pinch

BY CURT EPSTEIN

MATT THURBER

In the post-Covid pandemic environment, private aviation has surged as those with the means to avoid the airlines—with their close personal contact and still diminished schedules—have done so. While that has led to record traffic for most FBOs, factors such as rising fuel prices, inflation, and a tight labor market have put pressure on their payrolls and margins. These factors also have stressed the ability of companies to maintain staffing amid increasing work tempos.

Disruptions from Covid and the geopolitical fallout from the Russian invasion of Ukraine sent the retail price of jet-A soaring to record heights earlier this year, hitting more than $14 per gallon in the northeast in April. Brent crude reached a recent peak on March 8 of $127.98 per barrel, an 87.5 percent increase from the previous year, according to Oil Price Information Service (OPIS).

While the jump in fuel price is a concern, FBO executives point to an even larger issue. At a recent FBO industry gathering, when attendees were asked to identify the greatest challenge they are facing, staffing was far and away the most mentioned.

The problem has been endemic to the service industry of late, a lingering effect of the changes in the workforce wrought by the Covid pandemic. It has led businesses such as restaurants to curtail their hours and in some cases, even days of operation as they try to fill out their staff. Many FBOs are in the same situation with vacancies in their customer service and line service staff. **AIN** spoke with the general manager of an FBO in a large city that has eight vacant full-time positions. To make up the difference, management and supervisors have had to fill in as much as possible. "We try to close an hour or so earlier in the day, especially if we do not have anything on the schedule," he told **AIN**, adding the front desk is not staffed at the traditional hours like it used to be. "On the slower weekends we'll have a CSR come in an hour or two later and/or leave an hour or two earlier, and sometimes we'll use a single staffer where traditionally we've had multiple staff members there."

FBOs are encountering a new situation in terms of compensation, where other competitors for workers—particularly young entry-level workers for fast food restaurants—have had to increase their wages to attract enough staff to operate at their normal hours.

"If you look across the entire spectrum of entry-level jobs, pre-Covid there used to be a fairly different differential between the person applying at a [fast food restaurant] versus a person applying at an FBO," explained Douglas Wilson, president and senior partner of industry consultancy FBO Partners. "Maybe the fast food restaurant was minimum wage but the FBO offered a dollar or two above minimum wage and so it was a differential significant enough to

result in slightly higher candidates. Some entry-level jobs have increased significantly so now a fast food job may be much closer to what the FBO is offering."

With food industry worker prices on the rise to as much as $18 an hour in some areas, Wilson noted many FBOs have had to increase their opening salaries to maintain that same differential.

That has presented another set of considerations because those increases have a cascading effect on the normal FBO salary escalation schedule. "You can't really hire a person and start them higher than your existing staff who may not have caught up. So there also has had to be an increase in existing employee wages to keep that differential of experience," said Wilson. "When you do a budgeting perspective and raise the entire staff by $1, that's $2,000 a head I'm raising that rate over the course of a year. Now multiply that by FBOs that have 20 to 30 employees and now you have not only a labor matter with respect to hiring people but keeping your existing employees on par with inflation, which hit 9.1 percent for June year-over-year."

An informal survey showed that locations have had to increase their payroll by 15 to 40 percent to satisfy those demands.

In terms of recruitment, some FBO managers have noted difficulties in attracting suitable candidates. One midwestern FBO reported seeing a 40 percent no-show rate for candidates in interviews. Some FBO executives attributed that rate to state unemployment laws requiring a person to simply show that they applied to a certain number of jobs in a given period. As for those who do show up, another manager suggested that more people are job-hopping, trying to find new careers, and are not really worried if something doesn't work out.

Employee referral bonuses have become a near-standard in the industry, to be paid out if a new hire lasts for a predetermined period of time. Another traditional pipeline of FBO workers was aircraft maintenance schools. "The A&P schools were always great, but it seems recently though that the airlines are snatching those students up faster," said Scott Helms, general manager at Leading Edge Jet Center/SkyServiceUS, an FBO in Seattle. "They were already hiring them before they had their A&P license, so that's been a struggle."

"FBOs are finding new ways to constantly compete for talent," said Sam Scanlon, managing partner of industry recruitment firm JSFirm.com. "So much that we added a section to the site where job seekers can search by 'perks,' for example, sign-on bonus, flex schedule, etc. Job seekers understand it's competitive and they know they can find the position that they want, in an area that they want."

The recruitment problem seems more acute on the line service side, according to Dan Rutherford, manager of marketing and business development for Canadian aviation services provider FastAir. "Particularly on the line, on the fuel trucks outside, that's where the turnover has been in the past," he noted. "We have an extreme climate, hot and very cold outside, so it's tough to find that person, and they are taking more training than they used to."

For a line service position, that training involves an investment from the company in terms of time and expense. Scott Capehart, general manager of Aero-One Aviation at Alabama's Dothan Regional Airport, noted "if you are going through all the training programs, NATA Safety 1st, your own in-house training program and anything else that might be out there, it's not that it takes a long time to learn how to fuel an airplane, it's that it takes a long time for them to see everything they need

> "On the slower weekends we'll have a CSR come in an hour or two later and/or leave an hour or two earlier, and sometimes we'll use a single staffer where traditionally we've had multiple staff members there."

Competition for entry-level workers is high, and climbing wages are forcing FBOs to raise pay rates for employees at every level in order to retain top talent.

Gaining the experience needed to work around expensive jets can take about six months but that also depends on how busy the airport is and the kinds of business jet traffic it handles.

to see. You can only gain that with experience, and some places are faster than others." As an example, Capehart noted that FBOs at locations such as bustling Teterboro Airport will have more exposure to high-end large cabin business jets such as Gulfstreams, and their line technicians will become comfortable handling them more quickly than at his location, which by contrast sees a higher percentage of military aircraft. On average it takes six months of training to produce a fully-skilled line service technician.

"To release somebody out with a fuel truck and do those things, it does take time," said Rutherford. "Just to get it right and to have confidence that somebody is going to push a $30 million airplane into the right spot and not hit a few things on the way, it's a trust issue."

Some locations have gone to great lengths to fill positions. Helms noted that he took the extraordinary step of offering a relocation package to a line service supervisor he had worked with in the past. While such packages are commonly offered to general managers, they are unusual for line staff. "That's a person I want working at my FBO," he said, "and the costs to train and retain employees are so high, it was worth the cost to get somebody moved across the country that I knew was going to be here for a number of years."

Given the amount of training involved, Wilson suggests that the line service position needs to receive more recognition. "The mainstream news is talking about the pilot shortage and the mechanic shortage, but line service is not seen as that same sort of professional role," he said. "Until our industry starts turning the corner and looks at this as a skilled position, we're probably going to face very similar situations of just simply competing for labor using starting wages or signing or retention bonuses." To improve that situation, he suggested that the industry enact standardized training policies that would make a certain level of skills portable. Wilson cited as examples deicing or tow training and certification. "If I'm going from one FBO to another, [we could] recognize it in that way; perhaps that is a starting point."

> "We have noticed a steep decline on margin due to competition and the price of the commodity rising."

While attracting new workers is a concern, so too is keeping the ones that they have, said Rutherford, referring to discussions during an industry meeting he recently attended. "In the FBO world, the three things that came up were compensation, culture, and flexibility in employing this incoming and current workforce, and all of them have to be addressed."

He noted that management needs to be cognizant when a worker says they are unable to work on a weekend. "It becomes a longer conversation that you've got to be willing to flex, and if you can now get a Saturday morning and a Sunday evening from them it's a win," he told **AIN**. "Absolutely, it's way more work for me now than it was because I'm having a lot of conversations to figure out who can give me what shift. But if I don't, I'll lose them."

Aero-One Aviation's Capehart noted, "From our perspective as an FBO, I think we have done a pretty good job retaining our employees." In addition to increasing salaries by approximately 30 percent over the past several years, the company has also instituted a 401K matching program, 100 percent paid insurance for workers with buy-in for family members at their expense, and an end-of-year profit-sharing bonus. That pool is determined by several factors including fuel sales and industry recognition from sources such as **AIN**'s annual FBO Survey. If an employee does something negative that ends up costing the company money, that cost would be deducted from the pool.

"What that does is give them ownership in the company," said Capehart. "You're not going to have as much waste, whether that's energy usage or people tearing up equipment; things like that cost a lot of companies money."

In terms of culture, Rutherford noted that "people want to have a fun, rewarding, enjoyable work experience and they want to have clarity on how they are progressing. Again it's more work for leaders who aren't

used to doing that," he said. "It's celebrating the little wins and birthdays, probably things that are good practices anyhow but they've become essential now because [workers] will go somewhere where they do have that kind of fun environment."

PAYING THE PIPER

Given these labor pressures, service providers will eventually need to pass those costs along to their customers, and with fueling being an FBO's top revenue stream, aircraft operators will see it in their invoices. "I would say to expect fuel prices to continue to go up, and even when customers see or read news reports that the cost of a barrel of crude has gone down, FBOs will need to maintain a higher margin than they did previously until there is equilibrium between revenue and expenses," said Wilson. "The fuel prices will begin to trickle down but not at the rate they went up."

But FBOs may not have all that much flexibility in raising their margins from the amount added on to price per gallon of fuel sold. They use that margin to account for staffing, insurance, rent, utilities, and infrastructure development. "We have noticed a steep decline on margin due to competition and the price of the commodity rising," noted Helms.

For some clients, the FBO is virtually prevented from raising its margins. With high-traffic customers, many locations may offer a cost-plus pricing deal for their fuel purchases. Under that model, the FBO will sign a long-term arrangement with a major fleet operator or tenant that will guarantee they will pay a fixed margin over the wholesale cost of the fuel. The customer costs may rise depending on fuel prices such as in the recent price run up, but the FBO cannot change the margin it charges above that without renegotiating with the client. Many service providers are loathe to change that rate for fear of losing that customer. "The margins in those contracts is inflexible and often low," said Wilson. "Nobody signs up for a cost-plus $3 a gallon."

For the normal retail-minus customers, the FBO has a little more wiggle room. As they start from a higher price, they can change their margin to offer price breaks on volume discounts, but they can also increase it at will if necessary.

While the FBO industry traditionally changes its fuel pricing on Tuesday mornings, due to the recent market volatility, Helms has found himself forced at times to change it more frequently. "That may be changing from load to load today as prices are jumping that quickly," he told **AIN**. "It absolutely can be with the trucking supply, there have been freight add-on fees midweek, which from time to time do need to be passed along midweek."

"I think that is the challenge that everybody is pushing back against," said Rutherford. "Right now private and corporate aviation is red-hot and the current airline mess is only making it hotter. There's a lot of first-time people coming into the private flying market, and FBO's are stretched but are handling it now. If costs continue to rise because of all these pressures, that's something we're going to have to try to absorb. I don't know how the market will respond to those increased costs."

"I'm a private pilot myself so I feel for the pilots and flight departments on this one," said Helms. "When you are getting an invoice from an FBO on a transient basis, you don't like being nickeled and dimed, and [FBOs] are adding additional fees and things on there." He noted that cost-plus customers could soon start seeing additional fees on their invoices as well.

One idea Helms is considering is a flat "living wage" fee added on to each invoice to help offset the burgeoning employee costs. Such a concept has already been instituted in many restaurants with an extra fee added to each dining check.

› Safety Q&A continued from page 12

Q. What is an example of a simple way where risk management could be implemented?

A. I've given an example of the air tour crash in Kauai [Hawaii]. It involved a smaller operator that had a handful of helicopters and about 25 employees. It actually had some very good guidance and policies and procedures, especially for the aircrew. But there was no operational control over that. Management never was checking to see whether the pilots followed this. Several of their helicopters had cameras on them to recreate the customer's flight going through the beautiful valleys. Some [other] operators were using that as kind of a flight data monitoring. [The accident operator] could have gone back and reviewed the videos and evaluated whether they were following the guidance out of the manuals.

Q. How concerned is the Safety Board about operators having but not using their SMS programs?

A. We are very concerned. There have been some business aviation accidents where the operator had an SMS, but how effective was it? I think that that's one of the reasons we made it very specific on our Most Wanted list to not just require SMS but to verify the effectiveness of it. In the 121 world, there were a couple of accidents in 2019 that accounted for four fatalities. I think in both cases, the operator's SMS was not quite up to speed. Had they had an effective SMS, they might have caught a couple of the issues that led up to these accidents. We see that in business and charter aviation also. An SMS is not a one-and-done. It's not a book on the shelf. It's a living program. It's daily engaging everybody. It's constantly looking for hazards and risks. It's a constant, continuous living program.

Q. What are you seeing in terms of buy-in and willingness to use the SMS properly at these operators?

A. A lot of operations have an SMS but they may not be as effective as they should be. You have to have a good, positive safety culture that is nonpunitive. You need a reporting culture where everybody knows that they are the safety officer, and if they see something that's not right, they need to report it. Likewise, leadership and management need to be engaged when they receive reports. They need to investigate them, do something about it, and then they need to communicate it back. So, the communication has to be two-way. If it's not, that's not a great culture. There are some really good cultures out there. Unfortunately, in a lot of the accidents we go to, the safety culture is not where it should be. And as a matter of fact, we've done some accidents where they've been very negative. You can never have an effective SMS if you have a toxic safety culture.

Q. What is a message you would like to get across to operators?

A. Especially for those that don't have SMS, I always have two questions for them—what are the risks to your operation and how do you know? If you don't have a way, a procedure, a policy, or a program that is basically trying to identify the hazards and risks to your operation, then that puts your whole operation at risk.

› GAMA continued from page 8

Textron Aviation increased production of its King Airs, handing over seven more of the twin-engine aircraft than it did a year ago. Bend, Oregon-based Epic Aircraft ramped up production of its single-engine E1000GX, delivering six in the first half of 2022 compared with just one E1000 through the first six months of last year.

Pilatus remained nearly static on its PC-12s, delivering just one more this year than it did in the first half of 2021. Piper also boosted deliveries of its M500 and M600 turboprops by three units, and Italian airframer Piaggio delivered its first P.180 Avanti Evo in many months during the first half of this year.

Daher, which transitioned from the TBM 940 to the TBM 960, was the only one among the high-end turboprop makers to see its delivery totals decline as it ramped up production of the new model. The Tarbes, France-based manufacturer delivered 21 TBM 940s in the first half of 2021, but only five of the follow-on TBM 960 in the same period this year.

ROTORCRAFT

Deliveries of turbine-powered helicopters remained static with the 257 handed over in the first half of this year representing just two fewer than in the first six months of 2021, a less than one percent decline. Robinson Helicopter increased production of its R66 to 47 from 42, while Leonardo delivered 43 helicopters in the first half of the year, adding one to its tally from last year. Sikorsky delivered two S-92s, an improvement of one over the first half of 2021.

Airbus Helicopters and Bell were both off their totals from last year's first half, down by one and eight units respectively. In the case of the latter, the 407GXi saw six fewer deliveries this year.

Piston-engined aircraft as well were up by 9.4 percent over first-half 2021 totals, increasing from 583 units delivered to 638 through the first six months of this year.

"Since the initial setbacks of the pandemic, we have seen some segments make strides with growing backlogs and high rates of operations while others are still diligently working to navigate the path to recovery," said GAMA president and CEO Pete Bunce. "Despite supply chain and workforce issues, our industry continues to make progress and strategically posture for the future, which is a true testament to our strength and durability."

How LEO Enables Broadband Connectivity in Business Aircraft

NBAA-BACE, ORLANDO, FL • OCTOBER 19, 2022 • 12–1:30 PM

Shuaib Shahid, Gogo's director of international sales, holds the fuselage-mounted antenna that will enable Gogo's global broadband service.

Speakers will be announced soon!

Lunch will be served

WHAT YOU WILL LEARN:

- LEO + Small Electronically Steered Antenna = Low latency, high-speed broadband, for virtually any business aircraft anywhere globally.
- Hear directly from the experts who are bringing LEO connectivity to business aircraft from turboprops and super light jets to ultra-long range large cabin jets.
- It's compact: all you need is one AVANCE LRU, Gogo's ESA antenna, a single cable for power in, and a single cable for data out.
- Learn how Gogo's LEO satellite solution changes everything.

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Virginia Service Provider Opens New FBO Complex

Hova Flight Services, the single aviation services provider at Richmond (Virginia) Hanover County Municipal Airport (KOFP), has opened its new FBO facility. The $2.3 million complex on the east side of 5,400-foot-long Runway 16/34 includes a 7,500-sq-ft terminal—a major improvement over the previous 1,200-sq-ft structure built in the early 1970s—that will remain to house the company's flight school and Part 145 maintenance offices.

The new terminal features a passenger lobby, 12-seat conference room, pilot lounge with showers, a pair of quiet rooms, catering services, and flight-planning areas. The FBO also offers a 15,000-sq-ft hangar that can accommodate the latest ultra-long-range business jets. Hova, which has been in the service provider industry since 1992 and has had a presence at KOFP since 2004, also operates a full avionics shop.

Phase 2 of Arizona Mega Hangar Complex Opens

California-based Davcon Construction opened Phase 2 of its private hangar project at Mesa, Arizona's Falcon Field Airport in September. Construction on the complex, which can accommodate the latest ultra-long-range business jets, began in March 2020, with fully occupied Phase 1 opening last August.

The two phases, which were constructed at the cost of $70 million, consist of 350,000 sq ft of turnkey hangars ranging from 3,700 to 15,000 sq ft in either a wholly-occupied or shared format, plus an additional 50,000 sq ft of Class A business space. Phases 3 and 4, which will double the development cost, are slated to come online in Q3 of 2023, adding a further 250,000 sq ft of hangar, retail, and Class A office space.

According to Davcon president David Wakefield, the hangars are some of the first of their kind, incorporating solar energy and batteries within the design along with a number of other efficiencies. The unique design and execution of this project led to the facility winning an Energy Star quality award.

Ground handling services for the hangar tenants are provided by the Avflight FBO, which opened last year as part of the complex.

Connecticut Airport Introduces Customs Service

For the first time, Connecticut's Waterbury-Oxford Airport (KOXC) is offering U.S. customs service following the opening of a new dedicated Customs and Border Protection (CBP) facility.

The custom-built, 4,000-sq-ft facility was funded in partnership with Atlantic Aviation, the single service provider on the field, and the Connecticut Airport Authority. It is part of the Atlantic Aviation FBO's new 40,000-sq-ft hangar, which was constructed over the past two years, and includes briefing rooms, holding areas, and closed interview capabilities. The CBP location is open from 12 p.m. to 8 p.m. Wednesday through Sunday, with after-hours clearance available upon advance notice.

Oregon FBO First in State To Offer SAF

Another West Coast FBO is now offering continuous supplies of sustainable aviation fuel (SAF). Hillsboro Aviation, a service provider at Portland-Hillsboro Airport (KHIO), is the first in the state of Oregon to offer SAF.

The location received its first 8,000-gallon truckload of blended SAF from Avfuel earlier this month. A blend of 30 percent neat SAF and 70 percent jet-A, each load of the Neste-produced SAF provides a lifecycle carbon emissions savings of 19 tonnes, the equivalent of the amount of carbon sequestered annually by 22.5 acres of forests.

Neste's SAF is produced from renewable waste and residue feedstocks such as used cooking oil and is approved under ASTM D-1655 as a drop-in fuel at blends of up to 50 percent.

Modesto Jet Center: a gateway to California's Central Valley

Modesto Jet Center (formerly Sky Trek Aviation) has had a presence at California's Modesto City-County Airport-Harry Sham Field since the late 1980s. It was sold in 2019 and rebranded.

California's Central Valley is a major agricultural region that accounts for approximately half of the fruits and vegetables consumed in the U.S., and in its center sits Modesto and its airport Modesto City-County Airport-Harry Sham Field (KMOD). Until 2019, its long-time lone FBO was known as Sky Trek Aviation but its new owners decided to make a change. "I think they felt it was time to do something new and something fresh," said Otto Wright, general manager of what is now known as the Modesto Jet Center (MJC). "Nobody really knew where Sky Trek Aviation was, so it was kind of a nice way to announce who we are and where we're at."

Farming makes up a large portion of the FBO's clientele, according to Wright. "You've got guys who will fly in here with Citation Xs wearing dirty cowboy boots, jeans, and a big hat and that's kind of normal out here," he told **AIN**. Those customers help drive the location's peak activity periods, which come at the beginning and the end of the growing season. With almonds a big local crop, one would think that they would be a readily-available snack in the FBO, but with all the growers passing through MJC, Wright has eschewed offering them to avoid showing favoritism to any particular brand.

The facility offers a 3,000-sq-ft terminal that was built in the early 1990s. It features a large passenger lobby, pilot lounge, 12-seat A/V-equipped conference room, business center, and Wright's particular pride and joy: a fancy coffee machine. "You've got to have good coffee in the FBO business, and people come from all over the place because of our cool coffee maker," he said jokingly. A major remodel was delayed by the Covid pandemic but is back on track for the third quarter of the year.

Located 70 miles from the San Francisco Bay area, weather has been an issue at times at KMOD. "Modesto was not considered a good alternate because we would always get this fog that would settle in in the wintertime. But in the last number of years, we have not had that same fog, so the climate change has actually been sort of positive for us," noted Wright.

With more than 80,000 sq ft of hangar space that can accommodate aircraft up to the latest ultra-long-range business jets, the FBO is home to 20 aircraft including MJC's managed aircraft and charter fleet and a mix of turboprops and light jets. "Before the crash of 2008, Sky Trek used to have Globals and Gulfstreams based here because they didn't have any room in San Jose," said Wright. "It's taken 14 years but some of that business is starting to try and come back and we think it will."

As proof of that conviction, the company, a sister to charter operator Axis Jet, is awaiting approval to start construction on an $8 million hangar project that will add a pair of 30,000-sq-ft hangars. "The one thing we don't have here right now is private hangars with their own offices and private bays," said Wright. "That's one of the things that a lot of the Bay-area larger operators are looking for." MJC hopes to break ground in the first quarter of 2023. The facility has four acres of aircraft parking of its own, but it also has access to much of the ramp of the formerly commercially-served airport for larger or military aircraft.

The Avfuel-branded location pumps approximately 750,000 gallons of fuel annually from its 50,000-gallon tank farm (30,000 gallons jet-A, 20,000 gallons avgas). Its NATA Safety 1st-trained line staff operates 3,000- and 2,000-gallon jet fuel tankers and a 1,500-gallon 100LL truck. Self-serve avgas is also available.

The FBO, which has a staff of 12, is open 24/7. "We have a night guy because it's not like we get an avalanche of activity that happens in the middle of the night but we usually get a helicopter or two," Wright explained. "We're going to have a security person here anyway, so having a line guy who can fuel a helicopter in the middle of the night is pretty important."

When it comes to customer service, Wright encourages his staff to do whatever they can to help a customer. "Many of them have been brought up here, so they treat this as their home," he said. "When we have clients coming through, they go out of their way to be welcoming for transients, but our based tenants are considered like part of the family because they probably are. Everybody knows everybody in a small town." **C.E.**

BY JERRY SIEBENMARK

ExecuJet MRO Services Australia is offering new services to Falcon operators, thanks to additional training, tools, and equipment.

ExecuJet Australia Expands Mx Capabilities

ExecuJet MRO Services Australia in Sydney is expanding its Falcon capabilities through more training of its personnel and new tools and equipment. The Dassault Aviation-owned MRO has been sending its staff for advanced technical training to sites in France and the U.S.

Examples of the new equipment and training include learning how to check wear tolerances on horizontal stabilizer rear hinge bushings using a Subito bore gauge. Also, the MRO is bolstering its non-destructive testing to include ultrasonic inspection of the horizontal stabilizer, which is "a task we previously had to bring in specialists from Dassault to perform," said Grant Ingall, v-p of ExecuJet Australia.

As a result, the MRO can perform these inspections on the Falcon 50, 900, 2000, 7X, and 8X. In 2020, the MRO was approved by Australia's Civil Aviation Safety Authority to perform line and heavy maintenance on those models.

Threshold Aviation Acquires Another Hangar

Threshold Aviation Group, an aviation services provider based at California's Chino Airport (KCNO), has acquired an additional 50,000-sq-ft hangar from San Bernardino County. The newly leased structure, originally built to house military transports, is Threshold's fourth hangar of that size on the field and will be used to support its business jet operations. The company's managed and charter fleet includes Gulfstream G650s, G550s, and IVs, as well as Bombardier Challengers.

The FBO—which also offers MRO, completions, avionics, and aircraft brokerage services—now occupies 250,000 sq ft of hangar, shop, and office space. In addition, it has about a half million sq ft of ramp space at KCNO.

AAR Expands Maintenance Training Fellowship Program

Aviation services provider AAR Corp. has established fellowships with Vincennes University in Indiana and the Aviation Institute of Maintenance in Indianapolis to further expand the pipeline of aviation maintenance technicians.

Under the program, students selected as AAR fellows receive scholarships to pursue airframe and powerplant mechanic programs while working at an AAR facility. Following graduation, students who are in good standing are guaranteed employment with AAR. Earlier this year, AAR enrolled its inaugural class of fellows at its program in Rockford, Illinois.

"AAR's Fellowship Program removes the cost of education as a barrier to enter the aviation maintenance technician field," said Michael Gehrich, Vincennes University's director of aviation. "This shows AAR's commitment to help fill the aviation maintenance technician pipeline and connect students with the potential for a six-figure career track."

West Star Opens Embraer Support Center in Tennessee

West Star Aviation is standing up an authorized Embraer base maintenance facility at its Chattanooga, Tennessee facility with the addition of a leased 19,200-sq-ft hangar and a 7,000-sq-ft back shop. New LED lighting, fall protection, and remodeled office and lounge space are some of the features of the revamped facility. A fuel farm tank also has been added.

The dedicated Embraer facility is part of a larger expansion by West Star in Chattanooga, where it has started construction on more hangar and office space. When complete in June 2023, West Star will have a footprint encompassing 256,828 sq ft at the Tennessee airport.

West Star Aviation's new Embraer support center.

Pro Star Aviation plans facility, capabilities expansion

Since adding to its authorized service center credentials through Embraer last year, Pro Star Aviation is seeing a robust business, especially servicing the Brazilian airframer's light jets. "We've really hit the market pretty good with the Phenoms," Pro Star general manager Sean Peterson told **AIN**. "So it's been a pretty good start for us."

The addition of Embraer to the New Hampshire-based MRO provider's OEM service authorizations—which also includes Pilatus's PC-12 and PC-24—is one of the ways the company is looking to continue its growth. Pro Star is also an avionics and cabin management systems dealer and installer for the likes of Honeywell, Collins Aerospace, and Gogo. Avionics installation is a "big part" of Pro Star's business, Peterson said, and includes the company's "On The Fly" service in which it will travel to a customer's site for avionics installation.

Pro Star Aviation is an authorized Embraer and Pilatus service center.

Located at Manchester-Boston Regional Airport (KMHT), Pro Star operates from 74,500 sq ft of facilities including 25,000-sq-ft and 15,000-sq-ft hangars for maintenance and avionics work. The company recently hired five technicians, pushing its employee count to 60, and efforts are underway to recruit five additional technicians, in part to bolster its AOG support of Pilatus and Embraer customers. An FAA Part 145 repair station, Pro Star has received a Class 4 repair rating, allowing it to work on aircraft weighing more than 12,500 pounds. "It's a pretty big privilege for a company of our size," Peterson explained, adding most Class 4 providers are much larger MROs. "It gives us a lot of agility when it comes to providing aircraft maintenance and repair."

While it provides authorized service for Embraer and Pilatus aircraft, the company has a secondary focus on inspection, maintenance, and repair of Hawker and Bombardier Challenger 600 twinjets.

The third segment of Pro Star's business is special missions modifications and developing supplemental type certificates (STCs) through its engineering department, which has organization designation authorization and designated engineering representative approval for electrical systems. Supporting that work and its maintenance activity is a 4,500-sq-ft machine shop with five- and three-axis CNC machines and parts manufacturer approval. Peterson said most of its STCs are for modification of civil aircraft. With these capabilities, Pro Star is early in the process of not only developing STCs but planning to manufacture the kits that go along with the STCs. "That's one of my future goals, is to develop that strategy," added Peterson.

STC kits are only one part of Pro Star's future planning. The company also has a parcel of land at KMHT and is in the process of talking with airport officials about building another hangar there, "essentially looking to double our hangar space," he said. "That's probably going to happen within the next two years."

Peterson also envisions expanding its AOG capabilities with a dedicated team whose work hours are not incorporated into Pro Star's capacity planning.

And lastly, the company is closely watching the development of drones and advanced air mobility. While it's too soon to make definitive plans for serving that segment of aviation because of the nascent technology and regulation to follow, "we want to position ourselves to be a service center for those types of vehicles at some point," Peterson said. J.S.

Accidents

BY DAVID JACK KENNY

The material on this page is based on reports by the official agencies of the countries having the reponsibility for aircraft accident and incident investigations. It is not intended to judge or evaluate the ability of any person, living or dead, and is presented here for informational purposes.

Preliminary Reports

Gusts Lead To Caravan Freighter Runway Excursion

Cessna 208B, July 13, 2022, Salt Lake City, Utah

The pilot of the Part 135 cargo flight suffered minor injuries when the airplane crashed left-wing low off the right side of the runway at Salt Lake City International Airport. He reported that windshear encountered during the landing flare made it impossible to maintain directional control so he initiated a go-around, only to have a downdraft push the airplane into the ground.

A preliminary review found that 35 minutes before the accident, the National Weather Service had issued an Airport Weather Warning for outflow gusts of 26 knots or more. Two minutes after the crash the airport recorded gusts of 48 knots, and archived weather radar showed convective activity near the airport at the time of the accident.

Four Fatalities in New Mexico Firefighting Crash

Bell UH-1H, July 16, 2022, Chapelle, New Mexico

All four occupants perished when the Bernalillo County Sheriff's Department helicopter went down about five minutes after departure. The pilot, two tactical flight observers, and a rescue specialist were returning to their base at Albuquerque's Double Eagle II Airport after supporting the New Mexico Forest Service's efforts to contain the Calf Canyon/Hermits Creek wildfire complex. Following a fuel stop at Las Vegas Municipal Airport (New Mexico) and another water drop, the helicopter returned to the staging area, boarded the remaining personnel, and took off about 1915 local time.

ADS-B Out track data showed the helicopter flying straight and level westbound at 550 feet agl and a steady groundspeed of 133 knots. The track ended around 1920 about half a mile from the accident site. Two witnesses who were watching the sunset from a ridgetop saw the helicopter fly past, then descend rapidly into the ground without turning, kicking up a large plume of dust. The main wreckage was found inverted at the end of a 160-foot debris path. Both the main rotor mast and tail boom were fractured.

Crew Survives Medevac Helo Wire Strike

Eurocopter AS365N3 Dauphin 2, July 26, 2022, Hamilton, Ohio

Despite warnings of their proximity to the landing zone and the pilot's efforts to locate them from the air, the air ambulance struck high-tension power lines during its descent and fell 30 to 50 feet to the ground. The two pilots and medical crew member suffered only minor injuries, but all four main rotor blades were snapped in half, the main rotor gearbox and mounts were fractured, and the left engine was left hanging from its motor mounts.

The flight departed at 0428 local time to respond to a pre-dawn automobile accident. About nine miles out, the pilot contacted fire department personnel on the scene to request a briefing and was advised of high-voltage power lines on the south side of the landing zone. Winds were calm and the pilot orbited the scene from south to north, but was unable to locate the power lines using either night-vision goggles or the helicopter's landing light. Expecting them to be further from the landing zone, he initiated a steep descent, only to have the main rotor blades sever one of the powerline cables.

No Injuries in TBM Gear Collapse

Socata TBM 700, Aug. 3, 2022, Carlsbad, New Mexico

The pilot and both passengers were unhurt when the single-engine turboprop settled onto its belly after landing, skidding to a stop on the runway. The pilot said that he had entered the traffic pattern following another airplane from which he maintained visual separation. He recalled that his airplane seemed faster than usual even after he reduced power On short final, he heard "a low tone" that was not familiar but ignored it to "concentrate on landing the airplane." The propeller struck the runway as the airplane settled and came to a stop near the centerline.

Subsequent examination found the landing gear selector in the "down" position but the main gear only partly extended. Damage to the main gear doors was also consistent with the landing gear having been partially extended while the airplane slid down the runway. The pilot "did not recall when he put the landing gear switch down" or looking at the gear indicator lights during the approach.

Final Reports

Panel Configuration, Training Practices Cited in Night Ditching

Eurocopter EC135, March 14, 2018, Port Hedland, Western Australia

The Australian Transport Safety Bureau (ATSB) concluded that the instrument panel's configuration for single-pilot operation

hampered the instructor's ability to monitor the flight instruments, delaying recognition of a dangerous descent rate over the ocean at night. The instructor escaped after the helicopter crashed into the water during an attempted marine pilot transfer (MPT) from an outbound bulk freighter, but the pilot under instruction (PUI), whose last helicopter underwater egress training was in 2011, was killed.

The PUI had prior experience in both MPT flights and the EC135 but had not flown either since October 2011; in the interim, he'd flown Bell 206Ls from an inland base. He'd joined the operator in mid-February and completed 10 daytime MPT flights. The accident occurred on his first night of MPT flights under supervision; the ATSB noted that no more general night training was conducted before the night MPT flight. Conditions were clear but moonless.

The first approach to the ship was broken off after the descent angle became excessive. The helicopter climbed well above its intended 700-foot traffic pattern altitude, reaching 1,100 feet early on the downwind leg before beginning to descend. As it slowed, its descent rate increased beyond 1,000 fpm, reaching a maximum of 1,800 fpm at an altitude of 300 feet. The instructor called for an increase in power and the descent slowed, but only to 1,280 fpm in the seconds before impact. He later reported being unable to see the vertical speed tape on either the primary flight display or standby attitude module. The ATSB also cited the lack of less demanding night training prior to MPT training and the trainee's relative lack of recent make-and-model experience as increasing pilot workload in a degraded visual environment.

Cause of Fatal Engine Stoppage Not Determined

Piper PA-46 JetProp conversion, Sept. 20, 2020, Hilltop Lakes, Texas

NTSB investigators were unable to identify the cause of the total loss of engine power that precipitated an unsuccessful emergency landing attempt. The pilot and all three passengers were killed when the airplane stalled about one-quarter mile beyond the departure end of the private-use runway. ADS-B data showed that it descended from cruising altitude to the last data point about one mile south of the airport at an average rate of 1,392 fpm.

The flight was en route from Horseshoe Bay, Texas, to Natchitoches, Louisiana, at an altitude of 19,000 feet when the 59-year-old commercial pilot declared an emergency, reporting a total loss of engine power. He chose to divert to the Hilltop Lakes Airport (0TE4), a privately-owned, private use field with a 3,018-foot runway about five miles south of his location. ADS-B data indicate that the airplane flew directly to the airport and made one circle while descending. It entered a downwind leg for Runway 15 at an estimated 5,000 feet agl; composite flight track data indicated that a mile from the threshold of Runway 15, it was still at 1,250 feet at 169 knots groundspeed. Witnesses on a miniature golf course about one-quarter mile south of the departure end of the runway saw an airplane they thought was taking off until they noticed that the propeller was not turning. It entered a "really hard" left bank before the nose dropped and it crashed in a near-vertical descent.

Data downloaded from the airplane's Shadin Avionics engine trend monitor (ETM) showed three unsuccessful attempts to start the engine before takeoff; it caught on the fourth try. The ETM did not record any attempt to restart the engine during the descent. Checklist guidance for an engine failure called for trimming the airplane to maintain 90 knots indicated airspeed; recorded groundspeeds ranged from 122 to 172 knots. The power-off landing checklist recommended entering the downwind leg at 1,500 feet above ground level "for normal approach."

The NTSB found ample uncontaminated fuel on board and no evidence of any mechanical failure. They cited "the pilot's failure to establish and maintain a proper glidepath" as a contributing factor in the accident; principal causes included the initial power loss and "the pilot's failure to maintain control of the airplane, which resulted in an aerodynamic stall and spin."

"Gate-crashing" Error Damages Global 6000

Bombardier BD-700-1A10 (Global 6000), Oct. 13, 2021, O.R. Tambo International Airport, Johannesburg, South Africa

An apparent mixup in ground communications led the crew of a Maltese-registered Global 6000 to attempt to taxi through a gate opened for a preceding aircraft without contacting the gate operator. The right wing's number-two leading edge slat was damaged when the airport's Echo gate closed behind the leading aircraft as the Dubai-bound jet began to taxi through. The gate operator is in a remote location without a direct line of sight and responds to radio requests to open the gate, closing it once the requesting aircraft reports having passed through.

The investigation by the South African Civil Aviation Authority found that the Global 6000's crew contacted clearance delivery and then the Denel Campus radio operator, who cleared them to taxi at their own discretion and to "report through the Echo gate." They read back the instruction to give way to the preceding airplane, but never changed to the Apron Control frequency. Closed-circuit television footage showed the jet taxiing toward the gate as it began to close, veering left and stopping just before impact. The flight crew had been provided with a copy of the Apron and Denel Operating Procedures but had not previously visited the FBO.

Compliance Countdown

BY GORDON GILBERT

JUST AROUND THE CORNER

Oct. 4, 2022

NEW

U.S.: Drug Testing Documents

The U.S. Department of Transportation (DOT) is requesting public comment on how its regulations for conducting workplace drug and alcohol testing of workers in air and ground transportation could be amended to allow the use of electronic signatures on documents, the use of electronic versions of forms, and to electronically store data. The regulatory changes would apply to DOT-regulated employers, including those in aviation and their contractors, who administer drug and alcohol testing programs. Currently, employers and their service agents must use, sign, and store paper documents exclusively, unless the employer is using a laboratory's electronic Federal Drug Testing Custody and Control Form (electronic CCF) system. Comments are due by Oct. 4, 2022.

Oct. 6, 2022

Europe: Updates to CS-25

This notice of amendment (NPA) proposes to make updates to CS-25 large airplane certification standards in the following areas: ditching survivability; installed systems and equipment in the cockpit; performance and handling characteristics in icing conditions; brakes and braking systems certification tests and analysis; installed oxygen equipment and supply; air conditioning OFF maximum time period; and cabin crew portable oxygen equipment. Comments on the NPA are due Oct. 6, 2022.

Oct. 11, 2022

Europe: Rotorcraft Health Monitoring

EASA extended the deadline for comments from Aug. 11, 2022 to Oct. 11, 2022 for a NPA that will enable the use of vibration health monitoring (VHM) systems to be a more integral part of the continued airworthiness regime of Part 29 large rotorcraft. "Current acceptable means of compliance are not sufficient to ensure that VHM systems can be used to optimize maintenance interventions for certain rotorcraft," EASA said.

Oct. 25, 2022

Europe: Icing Contamination

Large airplanes certificated under EASA CS-25 are the subject of a NPA intended to mitigate the risks of incidents and accidents caused by airframe ground icing contamination or inadequate de-icing/anti-icing operations. The certification specifications for large airplanes would be amended in the following areas: design requirements for takeoff with a determined level of contamination of the aerodynamic surfaces; and criteria for the testing and selection of de-icing/anti-icing fluids. This NPA does not propose the mandate of onboard systems to alert the crew of potential contamination of the wing. Comments on the NPA are due by Oct. 25, 2022.

Oct. 31, 2022

Europe: Reduced Fuel Loads

EASA published rules that permit European Union-certified operators to reduce the amount of contingency fuel normally required to be carried, thereby reducing the CO_2 emissions and the overall environmental impact of the flight. While the rules recognize that extra fuel needs to be carried to account for unexpected situations that delay or prevent landing at the original destination, EASA explained that "The amount of additional fuel required can be optimized, while continuing to ensure high safety levels, due to improved risk assessment, calculations based on better data, and better decision making." The new rules are scheduled to go into effect on Oct. 31, 2022.

Nov. 13, 2022

Australia: Airport Certification

Revised Australian airport certification regulations (CASR Part 139) and an accompanying revised manual of standards (MOS) went into effect on Aug. 13, 2021. Under a transition period, operators of certified airports have until Nov. 13, 2022 to fully comply with the requirements and MOS publications.

Dec. 2, 2022 and Dec. 2, 2024

Europe: Part 145 SMS

Starting on Dec. 2, 2022, EASA Part 145 maintenance organizations are required to meet revised regulations that were published in November 2021. However, there is a two-year transition period, to Dec. 2, 2024, to allow maintenance organizations to correct any findings of non-compliance with the new Part 145 requirements. The main change introduced in the regulation is the required implementation of a safety management system.

Aug. 1, 2023

U.S.: Maintenance Schools

As part of an interim final rule overhauling aviation maintenance technician school regulations (Parts 65 and 147), the FAA is transitioning from using the mechanic practical test standards (PTS) as the testing standard for practical tests

needed to obtain a mechanic certificate with airframe and powerplant ratings. As a part of this transition, the FAA developed the mechanic airman certification standards (ACS), which adds task-specific knowledge and risk management elements. The FAA will use the PTS as the testing standard until July 31, 2023. Starting Aug. 1, 2023, the FAA will use the ACS to conduct the practical mechanic certification tests.

Aug. 10, 2023 and
May 16, 2024

Canada: ADS-B Out Mandate

Due to continued supply chain impacts stemming from the Covid pandemic, the previously announced implementation date for Automatic Dependent Surveillance (ADS)-B Out in Canada is delayed beyond the original date of Feb. 23, 2023. As a result, the ADS-B Out mandate will come into effect as follows: Class A Canadian airspace on Aug. 10, 2023; Class B Canadian airspace on May 16, 2024; and Class C, D, and E airspace to occur no sooner than 2026. The new dates have been developed from stakeholder feedback regarding supply chain limitations and backlogs to acquire and install the appropriate equipment.

Sept. 16, 2023

U.S.: Remote ID of Unmanned Aircraft

New FAR Part 89 required that after Sept. 16, 2022, no unmanned aircraft can be produced without FAA-approved remote identification capability. After Sept. 16, 2023, no unmanned aircraft can be operated unless equipped with remote ID capability as described in Part 89 or is transmitting ADS-B Out under Part 91.

For the most current compliance status, see: ainonline.com/cc

People in Aviation

BY KAIT WILSON

The *Corporate Aircraft Association* (CAA) named **David Scobey** president and CEO, while **P.J. Clark**, who has been CAA's acting president for the last six months, was promoted to COO. Scobey retired as president and CEO of AT&T Southeast and also served for six years as the chairman of the board of Lipscomb University, was the past chairman of the TBM Owners and Pilots Association, and served on the board of CAA for the last two years.

JOHN CARVER

Burrell Aviation hired **John Carver** to serve as CEO. Carver's previous experience includes being deputy executive director of special projects at Los Angeles World Airports from 2016 to 2020, leading the Land Optimization and Airport Resiliency Task Forces, and serving as executive director of VICC USA.

JetHQ promoted **David Coppock** to president—North America, after previously serving as v-p of sales. Also joining JetHQ and reporting to Coppock is **Sonya Sheldon**, who will serve as v-p of sales-East Coast, and **Cole White** as v-p-Central U.S. Coppock joined the company after holding leadership roles with manufacturers Bombardier, Gulfstream, and Hawker Beechcraft, as well as business development at Mente Group. Sheldon has spent her entire career in aviation, serving as a corporate pilot, flight test engineer at Gulfstream, and senior sales engineer, as well as working for a brokerage firm. White, an Army veteran and U.S. Military Academy graduate, also joined JetHQ from Mente Group, most recently serving as managing director.

TY DUBAY

Ty Dubay was hired by *Skyservice Business Aviation* as chief of staff, and **Qi Tang** was appointed as CFO. Dubay has more than 20 years of global leadership and operational experience in aviation and automotive services, having previously held leadership positions with NetJets. Tang has more than 25 years of experience in finance and business leadership, most recently as CFO and senior v-p of RioCan Real Estate Investment Trust.

Richard Koucheravy was named as executive v-p of *Vita Inclinata*'s Aerospace Division. Koucheravy's experience includes a 28-year military career, having previously served as division chief for aviation in the U.S. Army Staff's G8, as well as business development leadership roles at UltiSat, Sikorsky, and Lockheed Martin.

PAUL GOFFREDI

Turbine Engine Specialists (TES) has appointed **Paul Goffredi** as v-p and general manager of TES operations and **Dave Rassett** as v-p of sales. Goffredi joins TES after previously holding the role of president and COO at VSE Aviation as well as several senior positions held at the Killick Aerospace Group, Dallas Airmotive, StandardAero, and Aviall. Rassett was promoted within the company having previously managed TES operations over the last four years.

MAAS Aviation has appointed **Malachy McEnroe** to the team as CFO. McEnroe has worked in finance and business for over 25 years, having held senior finance roles at both GE and HNA and having served for seven years at TIP Trailer Services as global CFO.

Vincent Kavanagh was hired by *Four Corners Aviation* to serve as executive v-p and head of sales. Kavanagh joins Four Corners after being employed by Air Partner in various senior sales positions over the past eight years. He has also held sales management positions with VistaJet and NetJets Europe.

KRIS LARKIN

Kris Larkin has been hired as v-p and senior account executive for *SterlingRisk Aviation*. Larkin previously was client service supervisor at Arthur J. Gallagher & Company in the aviation practice division. Before that, she held positions with State Farm Insurance, Aviation Insurance Services of Illinois, and Near North Insurance Brokerage.

CMC Electronics appointed **Robert Kopersiewich** as v-p of engineering. He succeeds **Don Paolucci,** who is retiring after more than 40 years at the company. Kopersiewich's prior experience includes 10 years in aerospace and defense at CAE and nearly five years in fintech at Morgan Stanley.

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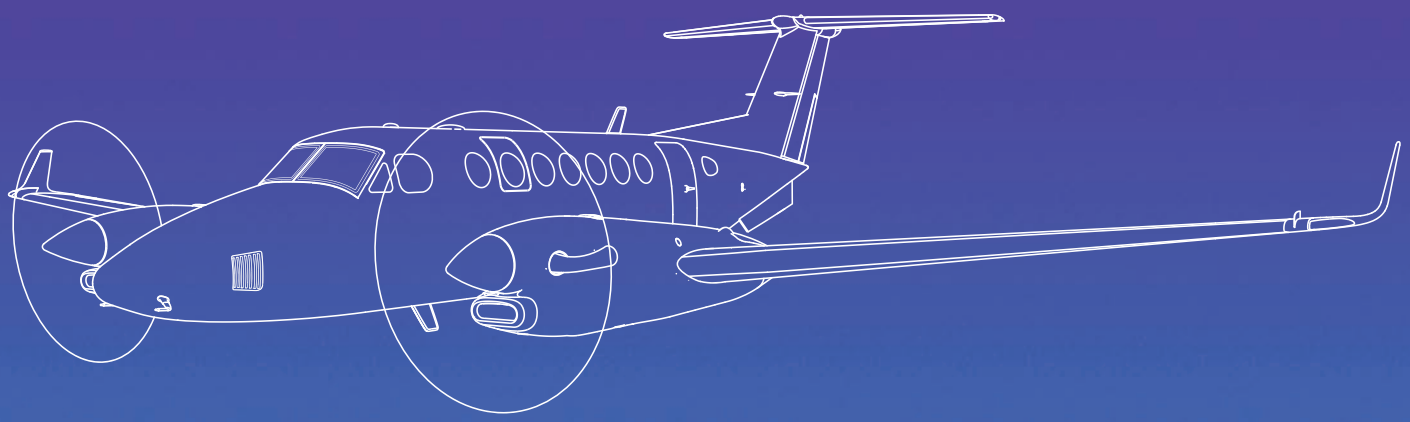

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15 f. Total Distribution	24,518	24,137
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15 h. Total Distributed /Not Distributed Copies	25,087	25,081
15 i. Percent Paid/Requested	100%	100%
16 a. Paid/Requested electronic copies	12,933	11,928
16 b. Total Paid/Requested Print & Electronic Copies	38,019	37,009
16 c. Total Requested Print Distribution & Requested Electronic Distribution	38,019	37,009
16 d. % Paid/Requested Print & Electronic Copies	88%	97%

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